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JOHN RICHARD EDWARDS, MALCOLM ANDERSON AND

DEREK MATTHEWS

Accountability in a Free-Market Economy: The British Company Audit, 1886

The relative merits of market forces compared with regulations as the more efficient mechanism for ensuring adequate accountability from business (and non-business) organizations is a subject of keen debate. Britain in the second half of the nineteenth century is regularly cited as an example of how the market will ensure adequate accountability in the absence of regulatory requirements. There is a great deal of speculation but very little hard evidence concerning the precise levels of accountability during this period. This study is designed to penetrate contemporary attitudes and actions by using primary sources to determine the audit arrangements made by quoted companies in the year 1886. It is discovered that professionally qualified accountants generally, and chartered accountants in particular, had achieved a dominant position by 1886, and possibly rather earlier; a finding which is also used to illuminate the question of the nature of the professional accountants' work in the late nineteenth century.

Key words: Accountability; Auditing; Free Markets.

This article has three primary purposes. First, to discover the extent to which U.K. quoted companies voluntarily adopted an audit requirement as a signalling device to shareholders, creditors and other business partners during a period which can properly be regarded as one of *laissez-faire* in relation to corporate accountability. Second, to find out whether companies choosing to have their accounts audited engaged the services of a professionally qualified auditor to do the work.[1] Third, to

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[1] The professional bodies in existence in 1886 were the Society of Accountants in Edinburgh (formed 1853), the Institute of Accountants and Actuaries in Glasgow (later in 1853), the Society of Accountants in Aberdeen (1866), the Institute of Chartered Accountants in England and Wales (ICAEW) (1880), the Society of Accountants and Auditors (1885), and the Corporate Treasurers' and Accountants' Institute (1885). The membership of these bodies in 1886 were: the Scottish societies, 355; the ICAEW, 1,371; the Society of Accountants and Auditors, 400; and the Corporate Treasurers' and Accountants' Institute, 68. For details of the structural development of professional bodies up to 1886 and afterwards, see Boys (1990).

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We are grateful to John Barratt of Price Waterhouse for providing us with the data which formed the basis for Table 7. The article has benefited from comments by participants at the European Accounting Association Congress, Birmingham, 1995, the Accounting, Business and Financial History Conference, Cardiff, 1995, and from seminars presented to the accounting departments at the universities of La Trobe, Deakin and Newcastle, Australia, 1995. We also acknowledge the comments received from the anonymous referee and the editor of *Abacus* on an earlier draft.

test for differences in audit provision between companies based on size, corporate structure, date of formation, and whether operating in industries which were subject to 'various degrees of regulation' (Parker, 1990, p. 52). The implications of our findings for the present understanding of the nature of the work undertaken by public accountants in the last quarter of the nineteenth century is then examined, focusing specifically on the available evidence relating to what has been described as the 'bankruptcy-auditing thesis' (Walker, 1993, p. 128).

The year 1886 has been chosen for the purpose of this study because it is the first year for which all the required data are available. These comprise reliable lists of quoted companies and information concerning the U.K. stock exchanges on which they were quoted, their size, industrial classification, where they carried on business and the names and qualifications of their auditors. The primary sources are: the *Investor's Monthly Manual (IMM)*, June 1886; *Burdett's Official Intelligence (BOI)* 1887; the annual reports of quoted companies for 1886;[2] and the lists of members of the professional accountancy bodies existing at that time.

The article is structured as follows: First, the nature of the companies covered in this study is explored in terms of method of incorporation and size. The mechanism through which improvements in accountability among British companies is believed to have occurred in the nineteenth century is then considered, and an assessment is made of the regulations applying to the quoted companies of 1886. Next, various measures of the qualifications of these companies' auditors are examined, highlighting three types of classification — professionally audited, non-professionally audited, and unaudited — for the population as a whole, and for the population analysed by company size, corporate structure, date of formation and whether the subject of regulation. The penultimate section of this paper re-evaluates the 'bankruptcy-auditing thesis' in the light of our findings and through an analysis of the contemporary literature.

THE NATURE OF QUOTED COMPANIES IN 1886

This article is concerned with the audit provisions applying to companies quoted on British stock exchanges in 1886. This date was just thirty-one years after the creation of the limited liability company by registration under the Companies Act.[3] The population of companies in existence in 1886 included a range of different types of organizations including *unincorporated* organizations. Unincorporated enterprises — deed of settlement companies and co-partnerships — had emerged prior to 1844 to produce many of the benefits of incorporation (Gower, 1957, pp. 31–4), including the scope provided by the joint stock mechanism for raising the finance required to undertake new ventures and expand existing operations. Chartered companies date from the sixteenth century and companies created by private Act of parliament from the seventeenth century, with those used for trading purposes arising during the canal construction movement of the late-eighteenth century. The oldest chartered company covered in our study is the New River Company (incorporated 1619), the oldest statutory company is the Bank of Scotland (1695), the the oldest statutory trading company is the Droitwich Canal Navigation Co. (1768). Both the above methods of incorporation were expensive; they also relied upon connections in high places to make them a reality. Further mechanisms were therefore devised through the courts and the ingenuity of lawyers to achieve certain of the key benefits of incorporation. These included incorporation under the cost-book system (Dolcoath Mine, 1799), and formation by deed of co-partnership (North of Scotland and Orkney & Shetland Steam Navigation Co., 1790) or by deed of settlement (Union Fire and Life Assurance Co., 1714). Cost-book companies were administered by special stannaries courts (Gower, 1957, pp. 8–9), while the other two arrangements were developed out of the partnership form of business organization (Gower, 1957, pp. 32–3). The last three categories of company mentioned covered relatively small-scale enterprises. There are examples of companies in all five categories subsequently registering also under the Companies Acts. The advantages of this further step included the desire to obtain the protection of limited liability or acquire additional powers. The 1,100 quoted companies of 1886 were made up of the following[4]: registered companies, 720 (65.4 per cent), statutory, 191 (17.4 per cent), chartered, 34 (3.1 per cent), chartered and statutory, 3 (0.3 per cent), deed of settlement, 17 (1.6 per cent), deed of co-partnerships, 4 (0.3 per cent), cost-book companies, 17 (1.6 per cent), unknown, 114 (10.3 per cent).

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[2] The London Stock Exchange required quoted companies to file a copy of their published accounts, commencing 1881. This collection, which formed the basis for the information contained in *BOI*, is now housed at the Guildhall Library, London, EC.

[3] The registered company was created by the *Joint Stock Companies Act 1844* and the option to register with limited liability eleven years later by the *Limited Liability Act 1855*.

Of the 1,100 British and Irish quoted companies listed in the *IMM*, 1886, nearly one-quarter (23.9 per cent) had an issued capital of below £100,000; indeed, over two-thirds (69.3 per cent) of such companies had made calls of below £0.5m (Table 1). The largest company was the London & North Western Railway with an issued capital of £101,558,165 This, however, was exceptional; most companies (97.9 per cent) had an issued capital below £10m. The smallest company (Green Hurth Lead Mining Company Limited) had an issued capital of just £1,920. The mean capital of all British and Irish quoted companies was £1,307,495. This was heavily weighted by the twenty-three companies with a capital in excess of £10m as evidenced by the median of £236,225 and the modal value of the distribution of £100,000 (twenty-nine companies).

London was already by far the most important market in corporate stock; indeed, of 1,067 companies for which the *IMM* provides details of the market where the shares of a particular company were chiefly traded, 630 (57.3 per cent) were in London.[5] The second largest stock exchange was Manchester (117 companies or 10.6 per cent), third was Edinburgh (95, 8.6 per cent). When the head office locations of the 1,100 companies are analysed, the importance of London is clear. Five hundred and seventy companies (or 51.82 per cent) were based in the capital city. The sectors

[4] We have used the companies' standing in 1886 for the purpose of this article. That is, companies formed under one category but then obtaining an additional or new affiliation (usually registration under the Companies Act) have been placed in the latter classification.

[5] For some of the 1,067 companies, more than one stock exchange is listed in the *IMM* as a market where its shares are chiefly traded. Companies are counted under each exchange for the purpose of constructing tables, and it is for this reason that the number of companies exceeds 1,067.

TABLE 1

CAPITAL DISTRIBUTION OF BRITISH AND IRISH QUOTED COMPANIES IN 1886

	No. of companies			
Capital (K)	Total	Cumulative total	% of grand total	Cumulative % of grand total
K < £0.05m	106	106	9.6	9.6
£0.05m < K < £0.1m	157	263	14.3	23.9
£0.1m < K < £0.5m	499	762	45.4	69.3
£0.5m < K < £1m	151	913	13.7	83.0
£1m < K < £10m	164	1,077	14.9	97.9
K > £10m	23	1,100	2.1	100.0
Total	1,100		100.0	

Source: *Investor's Monthly Manual; Burdett's Official Intelligence.*

for which a London head office base was most common were trusts, telegraphs and tea and coffee where over 90 per cent of companies were run from England's capital city.

MECHANISMS FOR ACCOUNTABILITY

The emergence of the joint stock company gave rise to the need for published accounting information, particularly for the purposes of enabling investors to monitor their money and to assess whether their funds had been gainfully employed. The extent of reliance on market forces or regulation as the appropriate driving force for achieving the desired level of accountability, however, extends along a continuum. At the one extreme is the entirely free market wherein directors voluntarily supply information to shareholders and other external users in response to their perceived requirements. A more formal free-market arrangement occurs where accountability is based on a contract voluntarily entered into between directors and shareholders.[6] Regulation of a non-statutory character may involve varying levels of enforcement,[7] and in Britain, as has been the case elsewhere (for example, the United States), there has been an apparently inexorable trend towards a greater degree of compulsion.[8] Finally, there is the possibility (and in the U.K. the reality) of accountability imposed directly by statute. In very broad terms, there appears to have occurred, in the U.K., a steady progression from free-market arrangements to a position of close statutory regulation.

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[6] In the case of the British registered company, these directions were contained in a deed of settlement between 1844 and 1856, and articles of association thereafter. In the case of chartered companies the charter itself served that purpose and in the case of statutory companies the relevant act of parliament.

[7] The *Recommendations on Accounting Principles* issued by the ICAEW between 1942 and 1969 were merely recommendations based on best practice which companies were encouraged to adopt. *Statements of Standard Accounting Practice*, prepared by the Accounting Standards Committee and issued individually by the professional accounting bodies between 1970 and 1989, outlined procedures which companies were expressly encouraged to adopt, while the accounting bodies relied on their members to ensure compliance and, in the case of the external auditor, to report non-compliance. *Financial Reporting Standards*, issued since 1991, possess even greater authority, both because they are issued by a body (the Accounting Standards Board) which owes its existence to statute law rather than the voluntary actions of professional bodies, and because there is a legal requirement for companies to explain and quantify the effect of non-compliance.

The regulations applying to the companies covered by this study were undoubtedly varied. Benston tells us that 'the general philosophy of the period (1856–1900) was that a company's financial affairs were a matter of concern only to its shareholders and their employees, the managers and directors' (1976, pp. 14–15).[9] This was certainly the case for the bulk of the companies covered by this study, which we noted were registered under Acts of 1844 or 1862. The *Joint Stock Companies Act 1844* contained radical arrangements for accountability (ss 33–42). These included requirements for an audited balance sheet to be presented to shareholders attending the general meeting, filed with the registrar and circulated, together with an audit report, to shareholders 10 days before the general meeting (variable by deed). These statutory obligations were repealed in 1856,[10] though more extensive accounting requirements were listed for possible adoption in the model articles of association contained in Table B attached to the new Act. Clauses 77–84 focused on audit matters and included provision for the appointment of an auditor (who need not be a shareholder) at the ordinary meeting held each year, for the auditor to be supplied with a copy of the balance sheet, to have access to the books and accounts of the company, to have the right to seek explanations from directors and the duty to report to the shareholders on whether the balance sheet and accounts 'exhibit a true and correct view' of the state of the company's affairs.

Many companies, particularly the larger ones, chose to register special articles of association rather than adopt Table B (Table A from 1862). Thus, it is unlikely that the above provisions are a reliable indication of the provisions applying to even the registered companies covered by this study. However, research into the articles registered by iron, steel and coal companies does indicate that the broad thrust of the recommended audit provisions were adopted, despite a tendency to 'water down' the reporting obligations imposed on the auditors (Edwards and Webb, 1985).

For most other categories of company covered by this study, the private arrangements reached are even more uncertain. In all cases, it was initially a matter of personal negotiation. The only public indication of what these contracts might have contained is found in the *Companies Clauses Consolidation Act 1845* which sets out model clauses that companies subsequently incorporated by private statute might choose to adopt. Clauses 101–8 differ from the corresponding provisions of Table B in the following important respects: there is a requirement that the auditor should be a shareholder; the auditors are given the power to employ accountants to assist them; and there is an absence of any indication regarding the content of the audit report. We might imagine that these provisions would often have found favour with company promoters in view of the fact that the Act was designed for adoption in full, thereby cutting down on the length of bills presented to parliament; also the fact that the contents of draft bills were the subject of parliamentary scrutiny.

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[8] Two exceptions are: the *Joint Stock Companies Act 1856*, which transferred the compulsory accounts and audit requirements contained in the *Joint Stock Companies Act 1844* to model articles (as Table B) which shareholders and directors might decide whether to adopt; and the *Joint Stock Banking Companies Act 1857*, which repealed the *Joint Stock Banks Act 1844*—the latter included obligations to supply shareholders with audited accounts, annually, and for the monthly publication of assets and liabilities.

[9] Many also claim that creditors played an important part in this process (Edey and Panitpakdi, 1956; Chambers, 1973; Hein, 1978).

[10] Possible explanations for this action include: the lack of demand for published information at a time when registered companies were still relatively small scale (railways were large but regulated by their own Act of parliament); the poor quality of the data filed under the 1844 Act; lack of suitably qualified personnel; and the political philosophy of *laissez-faire*.

Arguably the provisions of the 1845 Act are a recognition and reinforcement of the practice of appointing shareholders to undertake the audit function. The leading public accountant of the day, William Quilter, informed the 1849 Select Committee on the Audit of Railway Companies that this was the invariable practice in that industrial sector, and argued instead for the appointment of a professional accountant to do the work (quoted in Parker, 1986, p. 26). The appointment of shareholders at around this time drew the following comment from Pixley: 'many of the criticisms of early railway and bank auditing indicate that the audit function was often performed by interested amateurs elected by the shareholders from amongst themselves' (1897, p. 15). In a similar vein, Ernest Cooper stated that 'In the [eighteen] sixties professional auditors were the exception. Comparatively few large concerns, railways or banks, were audited by accountants' (1921, p. 554). The practice of appointing an amateur/shareholder auditor was the subject of determined attack as the accounting profession sought a monopoly of this work in the second half of the nineteenth century (Parker, 1986, pp. 23–39; Coombs and Edwards, 1996, ch. 7).

Contemporary legislation does not provide an insight to the audit regulations applying to the remaining categories of company covered by this study, namely the deed of settlement company, the cost-book company and the co-partnership. These remained entirely private arrangements between the contracting parties with no apparent influence from statutory provision. Given the emergence of these entities out of the partnership structure, we might imagine that the need for an audit was not initially a pressing issue, though this may well have changed later as each assumed the mantle of the public corporation through a quotation on the stock exchange. Frederick Whinney sheds some light on the actual practice of the most prominent of these last three categories:

> with Companies incorporated by Deed of Settlement, it was unusual to have auditors; in fact, some of the old Banks incorporated under Deeds of Settlement, had no power whatsoever to appoint auditors; and they were obliged to acquire that power when they did — as some of them did, lately — avail themselves of the Limited Liability Act. (1887, p. 387)

Despite Benston's conviction, noted earlier, that 1856–1900 was an era of *laissez-faire*, he acknowledges exceptions to this situation, namely 'the audit and reporting requirements imposed on certain types of companies by Parliament. Such companies included railways, and insurance companies, banks and deposit, provident and benefit societies, where a failure would cause losses to the general public' (1976, p. 15). Only two of the regulations alluded to contained provisions relating to audit that were in operation at the date of this study. The reintroduction of a degree of statutory accountability for companies began with the passage of the *Railway Companies Act 1867* and *Regulation of Railways Act 1868*. The former measure (s. 30) implied the need for an annual audit, while the latter regulation introduced a requirement to publish standardized accounts.[11] Like much accounting regulation, it was crisis-driven; in this case by the financial collapse of 1866 and, in particular, the failure of Overend Gurney Ltd. caused by railway companies defaulting on loans advanced on the basis of misleading accounts. The other relevant provision required banks to arrange for their affairs to be audited (*Companies Act 1879*, s. 7). Again the provision was preceded by perceived market failure, being subsequent to the collapse of the City of Glasgow Bank which, later investigation showed, had published unaudited and fraudulent accounts annually between 1873 and 1878 (French, 1985).

The *Companies Act 1900* (ss. 21–3) extended the requirement for a statutory audit to all registered companies. The requirements for accountability introduced at this stage incorporated many, but not all, of the amendments which were commonly included in specially prepared articles filed during the previous forty years by iron, steel and coal companies (Edwards and Webb, 1985), and probably others. It has been particularly noted that limitations placed by company promoters in specifying the scope of both the auditors' duties and his report were rejected, thereby recognizing the prime position of the external audit as a protection for shareholders (Edwards and Webb, 1985, p. 195). It was not until the *Companies Act 1947* (s. 23) that the requirement was introduced for the auditor to be a professional.

The level of accountability practised by late-nineteenth century U.K. companies cannot, therefore, be explained in terms of regulatory requirements. We know that the voluntary decision was made much earlier in Britain to prepare and publish audited accounts. Watts and Zimmerman (1983) have traced audit reports in England back to the late-sixteenth century, and even earlier to the merchant guilds. They have also drawn attention to the voluntary adoption of the audit by British companies in the second half of the nineteenth century, and used this knowledge to support their thesis that the market is the appropriate mechanism for dealing with such matters based on the principal/agent framework and the desire to minimize transaction costs (see also Watts, 1977; Watts and Zimmerman, 1979). The available information concerning the extent to which the accounts of British companies were audited, and the part auditing played in the overall workload of the mid–late Victorian accounting practice, however, is both sketchy and conflicting. Wallace (1987) reflects on the paucity of 'the market evidence' (p. 8), concluding that 'private markets [in particular] have been explored only to a limited degree'. We attempt to help rectify these matters in the remainder of this article.

QUOTED COMPANIES AND AUDITORS' QUALIFICATIONS

Research Method

The *IMM* for June 1886 was used to select for inclusion in the study all companies with headquarters in Great Britain and Ireland (excluding those in liquidation).

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[11] Railways were required to file an annual account with the Clerk of the Peace from 1847, where it was available for public inspection, while gas companies were required to do the same from 1860.

Companies with head offices outside Great Britain and Ireland were excluded from the study on the grounds that the regulatory, accounting and operational environments applying to their businesses differed from those applying to domestically based enterprises. The *IMM* allowed access to data on the industrial classification, the issued capital and the stock exchange(s) where the company's shares were chiefly traded. This information, together with that indicated below, was tabulated using a spreadsheet approach. *BOI* 1887 was then consulted in order to identify the auditors of each company in the population. *BOI* proved to be incomplete in its listing of auditors and, to ensure greater accuracy, the company's published accounts were examined where *BOI* was silent on the appointment of auditors.

Given the aims of this study, it was necessary to define what was meant by the term 'professional'. For exposition we chose membership of one of the major contemporary U.K. professional accounting associations: the ICAEW, the Society of Accountants and Auditors, the Corporate Treasurers' and Accountants' Institute and the three Scottish societies The lists of members of these bodies were then consulted to measure the extent to which quoted company auditors in 1886 were professionally qualified. Firms of accountants were deemed to be professional if at least one of their partners was a member of a professional accountancy body. Where an individual partner signed the audit report personally, this was treated for the present analysis as an audit client of his firm. Such a practice was common in 1886. Of 725 companies subject to a professional audit, 407 (or 56.1 per cent) of their audit reports were signed personally by accountants.

Findings

The main findings from this study are set out in Table 2. Of the 1,100 companies quoted in 1886, the audit profile of 960 was established by reference to either *BOI* or the company's accounts now deposited at the Guildhall Public Library.[12] The findings show that virtually all companies (98.2 per cent) were audited in 1886,[13] and that over three-quarters (75.5 per cent) were the subject of a professional audit. Chartered accountants held a virtual monopoly of the professional audit market. Seven hundred and nineteen of the 725 quoted companies employed chartered accountants as their auditor, with 608 engaging members of the ICAEW and 117 members of the Scottish societies.[14] The other six companies audited professionally were served by members of the Society who also shared two audits with members of the ICAEW. The professional firms also conducted a significant number of audits jointly with individuals who, one might imagine, were for the most part shareholder auditors.[15] One hundred and twenty-six companies engaged members of the ICAEW jointly with non-professional auditors, with the corresponding figures for the Scottish chartered societies and the Society seven and five companies respectively.

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[12] One hundred and forty companies had neither auditors listed in *BOI* nor was their annual report housed at the Guildhall Public Library. The broad profile of these companies is that they were smaller (52.1 per cent with issued capital of under £100,000 compared with 19.8 per cent for the 960 companies whose audit arrangements are known), formed earlier (43.2 per cent of those whose date of formation can be identified were formed before 1860 compared with 33.1 per cent for the 951 companies whose formation dates are known), non-registered companies as a proportion of registered and non-registered was rather higher (46 per cent compared with 25.4 per cent) and there was a higher proportion of non-regulated companies (77.1 per cent compared with 54 per cent). Given that the professional audit does not seem to have been a function of size, that the companies formed earlier and non-registered were rather less likely to be audited, and that non-regulated companies were more likely to be audited, there is no reason to believe that the findings from this study are significantly affected by the absence of information relating to 140 (12.7 per cent) of the companies quoted in 1886.

[13] It is possible that some or all of the seventeen companies listed as 'unaudited' were the subject of an audit which was not disclosed either in *BOI* or in the accounts deposited at the Guildhall Public Library.

Company size

Table 3 shows the distribution of professionally qualified auditors for the above 960 companies arranged, by quartile, in descending size of issued capital.

TABLE 2

AUDITORS' QUALIFICATIONS — QUOTED COMPANIES 1886

	Number	%
Professional qualification	725	75.5
Non-professional	218	22.7
Total audited	943	98.2
Unaudited	17	1.8
Total	960	100.0

Sources: *Investor's Monthly Manual; Burdett's Official Intelligence*; Lists of members; Guildhall Public Library.

TABLE 3

PROFESSIONAL AUDIT — DISTRIBUTION OF COMPANIES BY QUARTILE

Quartile	Companies	Professional auditors	Non-professional auditors	Unaudited
1	240 (100%)	182 (75.8%)	54 (22.5%)	4 (1.7%)
2	240 (100%)	184 (76.7%)	54 (22.5%)	2 (0.8%)
3	240 (100%)	185 (77.1%)	54 (22.5%)	1 (0.4%)
4	240 (100%)	174 (72.5%)	56 (23.3%)	10 (4.2%)
Total	960 (100%)	725 (75.5%)	218 (22.7%)	17 (1.8%)

Sources: *Investor's Monthly Manual; Burdett's Official Intelligence*; Lists of members; Guildhall Public Library.

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[14] These last two numbers sum to 725, rather than 719, due to the existence of six joint audits between chartered accountants qualifying north and south of the border.

[15] We are unable to test this supposition due to the lack of reliable sources. *BOI* sometimes indicates the existence of a share qualification requirement for auditors, but we know that the information provided was incomplete in this respect. However, we can be fairly sure that few of the joint audits were likely to have been shared with unqualified public accountants, (see footnote 30).

The quartile distribution highlights the fact that size of company was not a significant factor in determining whether a company would employ a professional auditor. Further analysis by decile broadly confirms these findings. For example, among the largest 30 per cent of companies, 75 per cent (216 companies) were professionally audited, whereas the corresponding figures for the smallest 30 per cent were 73.6 per cent (212). A significant difference over the full spectra of companies, compared with the overall averages, was confined to the smallest 10 per cent of companies where just 60.4 per cent (58 companies) were subject to a professional audit and 6.3 per cent (6) were unaudited.

Corporate Structure

We have seen that there existed six categories of company in 1886; the registered company created in 1844, and five other categories which predate the registered company and were designed to achieve the benefits of incorporation in a variety of ways. Earlier, sources were cited showing that companies in the 'non-registered' group would have been likely to start life either as unaudited or subject to audit by shareholders who were unlikely to possess any particular accounting experience.[16] The fact that the appointment of shareholders as auditors proved problematic might be inferred from the general tendency to appoint public accountants to fill the positions. The existence of a statutory requirement for the auditor to be a shareholder could of course be satisfied by a public accountant subscribing for shares in a company, but this could give rise to concerns over whether such action might prejudice independence An important change in the government's attitude towards the prerequisites for appointment as auditor was contained in the *Regulation of Railways Act 1868*, s. 11. It removed the shareholder qualification requirement from the 1845 Act where the relevant sections were adopted by railway companies subsequently incorporated. It was therefore expected that a number of 'non-registered' companies would have switched to the professional audit by 1886, but that the level of professional audit would have remained higher in the 'registered' grouping. Both these propositions receive strong confirmation from the findings presented in Table 4.[17]

Date of Formation

Boys has pointed out that 'Little has been written on the general development of accountancy firms in the British Isles' (1994, p. 16). We do know, however, that public practices date at least from the eighteenth century. The roots of what is today Coopers & Lybrand can be traced back to Tribe, Clark & Co., formed in Bristol in

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[16] The logic behind the shareholder audit is that these individuals had a personal interest in checking whether management was both honest and efficient. There also appears to be an underlying assumption that an audit required no specialized accounting expertise, which may not have been entirely unreasonable where business was small-scale and accounting principally on the cash basis.

[17] We note the higher proportion of companies 'structure unknown' that were subject to a professional audit relative to the non-registered category. The implication is that a significant proportion of the 'structure unknown' category were registered companies.

TABLE 4

AUDITORS' QUALIFICATIONS — CORPORATE STRUCTURE

Total companies no.		Registered		Non-registered		Structure unknown	
		No.	%	No.	%	No.	%
725	Professional qualification	574	84.6	119	51.5	32	64.0
218	Non-professional	102	15.0	101	43.7	15	30.0
943	Total audited	676	99.6	220	95.2	47	94.0
17	Unaudited	3	0.4	11	4.8	3	6.0
960	Total	679	100.0	231	100.0	50	100.0

Sources: *Investor's Monthly Manual; Burdett's Official Intelligence*; Lists of members; Guildhall Public Library.

1780, while at least six other English firms can trace their history to before 1820 (1994, p. 17). The directories list just five accountants in London in 1790 and twenty-four in 1809–11 (Brown, 1905, pp. 233–4), but the numbers increased dramatically, with the *Post Office London Directories* for 1860 and 1880 showing, respectively, 264 and upwards of 700 entries under the heading 'Accountants' and 'Accountants & Referees'.[18] We might imagine that the increased supply of accountants in London, similarly elsewhere, both reflected the growing demand for the accountants' services, including those of audit, and helped ensure that the requisite skills were available for companies incorporating in the second half of the nineteenth century, or for those deciding to transfer from an amateur to a professional audit.[19] The purpose of Table 5 is to explore this idea by examining the extent to which later incorporation is evident in the decision to employ individuals of sufficient standing to warrant membership of a professional body.

The findings presented in Table 5 provide some support for this supposition, though it must be acknowledged that other factors are likely to have been at work. Of particular significance is the fact that, from 1855, an inexpensive mechanism for registering with limited liability was readily available.

Regulated vs. Non-regulated

We have seen that the existence of a statutory audit for railways was assumed by the *Regulation of Railways Act 1868* and introduced in 1879 for banks subsequently

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[18] The 1860 directory marks certain entries 'arbitrators' or 'agents' or 'auctioneers' or 'referees', but does not make it clear whether these activities were in addition to or instead of accounting. In light of the changed title, the 1880 directory marks entries only for arbitrators or agents or auctioneers.

[19] Few of the individuals in the Post Office listings were likely to have been professionals within the definition used for the purpose of this article in 1860, and only a minority in 1880. Nevertheless, these figures provide a useful guide to the ready availability of the public accountant's services, while the contents of this article demonstrate the fact that the 'professionals' contained therein succeeded in achieving a strong hold on the quoted companies' audit by 1886.

TABLE 5

AUDITORS' QUALIFICATIONS — DATE OF FORMATION

	Professional qualification		Non-professional		Total audited		Unaudited		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Unknown	6	66.7	1	11.1	7	77.8	2	22.2	9	100.0
to 1800	10	47.6	7	33.3	17	80.9	4	19.1	21	100.0
1801-1850	127	60.2	75	35.5	202	95.7	9	4.3	211	100.0
1851-1860	39	47.0	44	53.0	83	100.0	-	-	83	100.0
1861-1870	170	78.7	44	20.4	214	99.1	2	0.9	216	100.0
1871-1880	246	86.9	37	13.1	283	100.0	-	-	283	100.0
1881-1886	127	92.7	10	7.3	137	100.0	-	-	137	100.0
Total	725	75.5	218	22.7	943	98.2	17	1.8	960	100.0

Sources: *Investor's Monthly Manual; Burdett's Official Intelligence*; Lists of members; Guildhall Public Library.

incorporated. More broadly, accounting regulations in one form or another had been introduced for the following categories of company by 1886: railways, gas, electricity, water, banks and insurance companies. Table 6 therefore presents, separately, audit classifications for railways, banks, regulated companies[20] and non-regulated companies.

Table 6 shows that regulated companies were less likely to be the subject of a professional audit. This finding is therefore suggestive of the possibility that the market was a more successful mechanism for bringing about stringent audit requirements than the statutory provisions in force at this time. The explanation for this paradox lies in the corporate structure of companies in the regulated category, as highlighted in Table 4. A high proportion of regulated companies were formed by means other than registration under the Companies Act. This point is illustrated well by Table 6 in the case of railways; these were mainly statutory companies and just two-thirds were the subject of a professional audit. It must be acknowledged that the position is quite different in the case of banks — the only other category of companies where statutory provisions made explicit reference to the need for an audit — but special factors were at work. The position changed substantially in the short period between the dramatic collapse of the City of Glasgow Bank (1878) and the year covered by this study. Of the sixty-five banks formed prior to 1855, which registered with limited liability post-City of Glasgow Bank, sixty-one were professionally audited in 1886.

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[20] The regulated grouping excludes electricity companies as these are not clearly identifiable from *IMM* or *BOI*. The absence of a separate classification in these publications, together with the recent development of the industry in 1886, suggests that the number of electricity companies was small.

TABLE 6

AUDITORS' QUALIFICATIONS — REGULATED AND UNREGULATED

	Professional qualification		Non-professional		Total audited		Unaudited		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Regulated	304	68.9	126	28.5	430	97.2	12	2.7	442	100.0
Non-regulated	421	81.2	92	17.8	513	99.0	5	1.0	518	100.0
Total	725	75.5	218	22.7	943	98.2	17	1.8	960	100.0
Railways	87	66.4	43	32.8	130	99.2	1	0.8	131	100.0
Banks	130	84.4	19	12.3	149	96.7	5	3.2	154	100.0

Sources: *Investor's Monthly Manual; Burdett's Official Intelligence*; Lists of members; Guildhall Public Library

THE BANKRUPTCY-AUDITING THESIS RE-EXAMINED[21]

The work profile of the Victorian public accounting practice has been a subject of lively debate. The present literature, however, lacks consensus concerning the precise position (a) when the British capital market was developing its trade in corporate stocks; (b) when the accounting firms which formed the basis of today's giant practices were becoming firmly established, and (c) when the process of professionalization was under way. Parker (1986) has pointed to the absence of any reference to auditing in the original charters of each of the two Scottish societies, formed in the 1850s (p. 17), and to its inclusion as 'an afterthought' (p. 20; see also Napier and Noke, 1992, p. 36) in the constitution of the ICAEW (established 1880), as evidence of the relative lack of importance of this aspect of the professional accountant's work up to the 1880s. The conventional wisdom (Stacey, 1954, p. 97; Stewart, 1977; Jones, 1981, ch. 2; Parker, 1986; Kedslie, 1990) therefore argues that insolvency was the most important fee-earning activity for professional accountants down to the late-nineteenth century, when auditing emerged. Such a conclusion is borne out elsewhere in the literature, including the histories of professional bodies, the 'house' histories of accountancy firms, the biographies of leading accountants and in specialist articles. The oft-quoted remark that the accountancy profession 'was born through bankruptcies, fed on failures and fraud, grew on liquidations and graduated through audits' is consistent with this school of thought (Robinson, 1964, p. 30).

The move of professional accountants into auditing in the late-nineteenth century is largely attributed to the growth in the number and scale of limited-liability companies, the consequent divorce between ownership and control, and the demand from 'blind' investors for information on the state and progress of companies (Howitt, 1966, pp.

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[21] We acknowledge the fact that the definitive answer to this question must await further analysis of the extant business records of professional practices covering the nineteenth century. The surviving records of accounting firms are detailed in Habgood (1994).

40–2; Jones, 1981, pp. 50–2; Edwards, 1989, pp. 201–2). This change of emphasis in the work of the accountant is usually illustrated by reference to the information available in respect of the fee income for Whinney, Smith & Whinney and its predecessor firms.[22] This reveals that from the mid-nineteenth century down to 1880 the firm generated more than 70 per cent of its revenue from insolvency. Indeed, in 1858, 1865 and 1870, 93 per cent of fee income came from that source (Jones, 1981, p. 47). Audit grew slowly in terms of its fee-earning potential for the firm; in 1875, for example, just £617 (or 4.3 per cent of total fee income) was generated from this activity. However, during the last quarter of the century audit fees spiralled. While insolvency fees as a proportion of total fee income declined in the second half of the century, and the audit proportion of total fees rose, it was not until the 1890s that audit became the most lucrative source of work for the firm (measured in terms of total fee income). These numbers have been widely quoted as evidence of the nature of a Victorian accounting practice (for example, Parker, 1986, p. 22), with Napier and Noke (1992, p. 35) drawing particular attention to the fact that, as late as 1880, insolvency work generated 72 per cent of fee income while audit generated only 11 per cent.

Despite the above findings, there is evidence to suggest that the importance of insolvency for mid-Victorian accountants has been somewhat overstated and, consequently, the variety of their work underestimated. Assertions in earlier house histories (for example, Kettle, 1957, p. 3) have probably been accepted too readily at face value by subsequent writers (for example, Parker, 1986, pp. 20–2; Edwards, 1989, p. 202). Indeed, the bankruptcy-auditing thesis has been the subject of recent criticism by Walker (1993, pp. 128–9) on the grounds that it is not based on the records of accountancy practices and that there has been a tendency to adopt a teleological approach to history by focusing excessively on changes in accounting work explicable in terms of identifiable economic and legislative developments.

The findings from the present research add to these concerns. A danger, particularly in a young discipline, is for a conventional wisdom to develop on the basis of a single, well-regarded, piece of research. In the context of this study, Jones' (1981) pioneering analysis of the fee income of Whinney, Smith & Whinney has been used to offer generalizations of the work of professional firms. The validity of such generalization relies on the firm in question being representative of the population. We suggest that Whinney, Smith & Whinney (and its predecessor firms) were atypical in two important respects.[23]

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[22] The firm name Whinney, Smith & Whinney dates from 1894. Previous names include Harding, Whinney & Co., 1859–66 and 1872–86; Harding, Whinney, Gibbons & Co, 1866–72; Whinney, Hurlbatt & Smith, 1886–94.

[23] Harding, Whinney & Co.'s atypical specialization in insolvency in the mid- to late-nineteenth century has an obvious present-day parallel. The 1994 fee income breakdown of Arthur Andersen reveals that it relies far more heavily than most large firms on one area of work—consultancy—deriving 58.2 per cent of its fees therefrom. On average, the top six contemporary firms (which includes Arthur Andersen) derived 38 per cent of fee income from audit/accountancy (Arthur Andersen generated 18.9 per cent of its total fees from this source), 25.8 per cent from consultancy and 23.2 per cent from tax. However, the top six average consultancy figure is heavily influenced by Arthur Andersen; indeed, all the other five firms generated a higher fee income from tax than consultancy. Thus, to generalize on the scope and extent to which accountancy firms offered services, on the basis of the fee income data for any one firm, is fraught with danger.

First, the 1867 Select Committee on the Limited Liability Acts reported that Harding, Whinney & Gibbons, together with Coleman, Turquand, Youngs & Co., had 'cornered the market in liquidations' and was responsible for administering sixty-one out of 259 liquidations proceeding in 1866 (Jones, 1981, pp. 46–7). Other major firms of the day, such as Price, Holyland & Waterhouse and Quilter, Ball & Co., were responsible for just eight and five liquidations respectively. While Harding, Whinney & Gibbons was clearly heavily involved in liquidations, our research for 1886 reveals its successor, Harding, Whinney & Co., not to be of major importance in terms of quoted company audits with just eleven clients.

Second, Robert Palmer Harding, the senior partner in Harding, Whinney & Co. until 1883 and the ICAEW's second president, was clearly a leading expert if not the leading expert in insolvency matters. He informed the 1877 Select Committee on the Companies Acts that he had been personally involved with the liquidation of sixty-two companies and that his firm had administered a further 142 (British Parliamentary Papers, [BPP], 1877, viii, minute 1387). Such was Harding's reputation in insolvency that in 1883, when on the point of retirement, he was persuaded by Joseph Chamberlain to take the post of Chief Official Receiver (Jones, 1988, p. 224). His seven years service in that capacity ultimately brought Palmer the distinction of being the first accountant to receive a knighthood (in 1890).

We are also of the view that Jones' citation of Turquand's evidence to the 1877 Select Committee on the Companies Acts as proof of the 'rising levels of insolvency . . . in the 1870s and 1880s' requires elaboration and modification (1981, p. 48). In answer to the question 'Have you in your business had much to do with joint stock companies?', Turquand replied, 'With the liquidation of them I have had a great deal to do' (BPP, 1877, viii, minute 385). He did not mention audit. Jones, however, fails to mention the fact that Samuel Lowell Price (of Price, Waterhouse & Co.) informed the same Select Committee that he conducted a 'considerable amount of auditing of public companies' (minute 1185). Indeed, Jones, in his entry for Turquand in the *Dictionary of Business Biography,* reveals that Turquand 'was not particularly interested in auditing and left most of it to the other partners' (1986, p. 583). This latter view is consistent with the findings of this research. While it is true to say that Turquand signed just four audit reports personally, this fact cannot be used as an argument to support the conventional view that insolvency was the most important fee-earning activity for professional accountants down to the late-nineteenth century. Although Turquand was preoccupied with insolvency matters, his firm was by far the largest auditor of British and Irish quoted companies in 1886, having sixty-nine clients (Andersen, Edwards and Matthews, 1996). Therefore, to take Turquand's 1877 comments at face value without considering the wider picture is to misread and misrepresent the evidence.

Clearly, Edey and Panitpakdi (1956) were aware of the likely importance of audit work to late-nineteenth century accountants. They inferred, from the absence of any requirement in the *Companies Act 1879* comparable to the arrangement envisaged by the model articles attached to the *Companies Act 1862* for the employment of accountants by shareholder auditors at the company's expense, that 'the appointment of professional auditors was becoming more usual' (p. 370). Indeed, as early as

1860, audit was of such importance to the firm of Begbie, Robinson that one of the three partners, Frederick Hockley, was fully engaged on company audits (Begbie, Robinson, Cox and Knight, n.d., p. 21). Pixley commented as early as 1881 that 'nearly all the prospectuses of new companies now include among their officers the names of professional accountants as their auditors, while the older companies are gradually replacing the shareholder auditor by a professional one' (p. 161).

By 1883, Frederick Whinney argued that 'the auditing of accounts is a *very important* item in an accountant's work' (Jones, 1981, p. 51). Pixley went further, in 1885, claiming that 'The auditing of the Accounts of individuals, firms, and public companies, also of executors and trustees, and corporations, forms the foundation of the practice of professional accountants' (1897, p. 7). Nine years after the date focused on by this study, Beresford Worthington observed that the 'practice of having regular audits is now widely prevalent in the commercial world' (1895, p. 62). In 1921, Ernest Cooper, looking back over fifty-seven years as an accountant, cites an investigation made by the ICAEW's president some years earlier which showed that chartered accountants had charge of about 95 per cent of the auditing business of substantial concerns, apparently confirming an inquiry he had carried out some years previous to that.

The main findings from this research, set out in Table 2, therefore appear consistent with the broad thrust of the impression conveyed by the *contemporary* literature. At the same time, the professionalization of quoted company audits must have proceeded very quickly if the ICAEW did, indeed, rate it worth no more than 'an afterthought' in 1880. More likely, the location of the reference to auditing at the end of the services identified in the ICAEW's charter must be put down merely to chance. The likelihood is that change was well under way by 1880.[24] The following comment made by Cooper may be of relevance: 'Only two firms, which in 1864 were, I believe, in a large way of business, now remain' (1921, p. 553). This suggests a considerable turnover in firms between 1864 and the date of our study, as the main names for 1886 (mergers apart) remained fairly constant over the following century. We might therefore speculate that a period of rapid change occurred in the late 1860s and 1870s, as the professional audit 'took off', and this resulted in firms which failed to obtain a share of the new work losing ground.

We must nevertheless acknowledge the fact that there are certain comments in the contemporary literature which, at first sight, appear inconsistent with our findings. The author of *A History of Accounting and Accountants*, Richard Brown, implies that the rise to prominence of accounting work in the offices of public accountants occurred in the last quarter of the nineteenth century (1905, pp. 317–18). This is not *necessarily* inconsistent with our own findings, however, though Brown may have placed the transition a little late through emphasis on the Scottish scene. Writing in 1897, Pixley states that the advantages of employing professional accountants as auditors was becoming more recognized, but complains that it was not yet fully appreciated (1897, p. 7). An editorial in *The Accountant* around this time claimed that 'it was solely chartered accountants who were being appointed auditors of the many public companies being floated' (1897, p. 975), but also drew attention to the fact that a large number of provincial audits remained in the hands of amateurs (p. 122). It may well be the case, however, that Pixley's concern was that the value of audit work undertaken was insufficiently appreciated; a complaint which has been echoed many times over the years. Comments made in the editorial in *The Accountant* were not of course confined to quoted companies, and it may well be the case that a significant number of unquoted audits remained in the hands of amateurs in 1897.

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[24] Certainly, an examination of the accounts filed with the Stock Exchange for 1881 — the first year for which they appear to have been collected — suggests that the professional audit was *already* well established. We did not base our study on 1881 as the collection for that year is far from complete.

The Nature of a Company Audit in 1886

We are therefore able to conclude that professional firms in 1886 dominated the audit provision for quoted companies, but there remains the question of whether it is likely to have amounted to a significant proportion of their work, by value. The answer to this may revolve around the question of whether the audit amounted to a relatively superficial examination of business records — what has been referred to as the 'mechanical audit' — or whether it was often a thorough exercise requiring a substantial commitment of resources. Some light has been shed on this question in the previous section. Further, our knowledge of the likely significance of the late-nineteenth century company audit is increased by using audit staff rates of remuneration taken from the histories of accounting firms, audit fees obtained from company archives, and comments on the intended scope of the company audit contained in the contemporary literature. For example, the history of J. and A. W. Sully suggests charge-out rates in the 1880s of 15 guineas per week for a partner, 10 guineas per week for a senior clerk and 5 guineas per week for an articled clerk (Sully, 1951); figures which receive rough confirmation from Kettle (1957) and Letts (1980). At the Bristol practice of Curtis, Jenkins & Co., data covering the periods 1851–7, 1862–7 and 1876–7, indicates, with minor exceptions, that principals were charged out at a rate of £2 2*s*. 0*d*. per day and clerks 15*s*. per day. There was no categorization of clerks into grades for charge-out purposes. These rates were applied to all jobs and probably remained unaltered down to 1894.[25] Further corroboration of these kinds of rates can be found in a letter from Edwin Waterhouse to one R. L. Pratt of Darlington, in 1884, which made it clear that there were no fixed rates for an accountant's fees but 'some' charge three guineas a day for a principal's time and one or one and half guineas for a clerk. '£3 3s is of course much less than I estimate my own time as worth and get for it' (quoted in Jones, 1995, p. 59).

The audit fees charged for Bolckow Vaughan (Chadwick, Collier & Co, 1874; Alfred Tongue & Co, 1899), the Steel Company of Scotland (Walter Mackenzie, CA and George Robson, 1879), Pearson and Knowles (Blease & Sons, 1875, 1885), the Shelton Iron and Steel Company (Deloitte, Dever, Griffiths & Co., 1891), Bell

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[25] Private correspondence with Mr S. V. P. Cornwell, formerly senior partner in the Bristol office of Coopers & Lybrand, with whom Curtis, Jenkins & Co.'s successor firm, Curtis, Jenkins, Cornwell & Co. merged in 1966.

Brothers (W. B. Peat, 1899) and Staveley (Chadwicks, Collier & Co., 1881) — all quoted companies — at various dates in the last three decades of the nineteenth century average £245 per annum. Assuming each category of staff spends an equal amount of time on the audit[26] and the fee is designed to cover Sully's charge-out rates exactly, the number of man days worked would amount to approximately 122.

At the massive Bolckow Vaughan, where Chadwicks Collier & Co. and later Alfred Tongue & Co. were auditors, the audit fee amounted to £400, and one might imagine that the audit occupied a significantly greater number of man days. It might be added that the charge-out rates for seniors and for articled clerks comfortably covered their salaries and overheads, with a surplus likely to accrue to the partner in each case. The articled clerk rarely received anything beyond the return of the premium over the period of articles, while salaries paid to professional staff were a fraction of charge-out rates which, assuming a forty-eight week working year at ten guineas per week, would have amounted to £504. William Plender began work for Deloitte, Dever, Griffiths & Co. in Spring 1884, having qualified the previous December with the Newcastle firm of chartered accountants, John G. Benson & Co. He was granted a salary of £100 per annum at Deloittes, described by Plender's biographer as 'the current rate of remuneration for newly-qualified accountants' (Edwards, 1985, p. 737).

Further insights into the nature of the late-nineteenth century audit and audit practice are obtained through recent revelations relating to Price, Waterhouse & Co. (Jones, 1995) and our own work on this company's archive. Jones tells us that 'Although not one of the oldest nor one of the first-rank practices of the 1860s, a consistent and determined commitment to auditing propelled Price Waterhouse ahead of many of its better-established rivals' (1995, p. 44). The nature of Edwin Waterhouse's early work is made clear in an analysis (p. 395) which shows that, between February and December 1864, 80 per cent of his time was spent on the preparation of accounts and audit, 11 per cent on investigation of accounts and audit and 9 per cent exclusively on audit. Waterhouse started as a clerk to Coleman, Turquand, Youngs & Co. in 1861–4 and, during this period, worked on the audit of London and North Western Railway, for whom J. E. Coleman was the public accountant appointed to advise the shareholder/auditors. When Coleman resigned in 1866, the company turned to Waterhouse to perform a task which he continued to undertake until 1882. He then succeeded to the position of elected auditor, which suggests that he may have been a shareholder in the company by this time. The reputation which he built up in this area no doubt explains subsequent appointments as auditor referred to in the next section.[27] Jones explains away the emphasis of

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[26] While this is an heroic assumption, it nevertheless serves to illustrate the time input of firms to audits. If partners spent less time on audit (certainly Turquand, Youngs did not have enough partners for each of them to spend nearly six man weeks on each job), the total amount of time devoted to the audit would increase.

[27] Such seems to have been the pressure of work that, amazingly by today's standards, Waterhouse refused the invitation to stand as auditor of the prestigious Midland Railway Company because 'my hands are perhaps already too full to allow me to give so important a matter the personal attention it would require' (quoted in Jones, 1995, p. 55).

Price, Waterhouse on auditing, in contrast to his earlier findings for Whinney, Smith & Whinney, on the grounds that the firm entered the market late (1995, p. 4). This may or may not be an accurate assessment. It would certainly be consistent with Cooper's view, noted above, that there was a substantial turnover in the lists of leading firms from the mid-1860s onwards, with firms concentrating on this rapidly expanding area of work quickly gaining prominence.

We have carried out an analysis of Price, Waterhouse & Co.'s 1897 Letter Book which has recently become available. Admittedly, this date is rather later than the principal focus of this paper but, in view of the arguments put forward by Jones, there is no reason why the findings should not be seen as reasonably representative of work undertaken following the formation of what was Price, Holyland & Waterhouse in 1865. This details surviving fee notes for services rendered by the firm, thereby providing us with an insight into 45 per cent (£20,760) of the total fees earned (of approximately £47,000) in that particular year. The fee income breakdown by area of service is shown in Table 7.

Nearly one-half of known fee income was derived from audit in 1897, and one might imagine that much of the work referred to as 'Examination of Accounts' was of a similar character. In terms of fees paid, both the firm's largest clients in 1897 were quoted railway companies: the London and North Western Railway (£850 — two half-yearly fees of £425) and the London, Brighton and South Coast Railway (£700 — two half-yearly fees of £200 for the audit of the share transfer department and two half-yearly fees of £150 for the audit of the accountant's department). The firm was clearly eager to accept business irrespective of size, as evidenced by the number of audit fees of ten guineas or less.[28]

TABLE 7

FEE INCOME BREAKDOWN FOR PRICE, WATERHOUSE & CO., 1897

Activity	Fees (£)	% of fee income	No. of different clients	Average fee per client (£)
Audit	9,772	47.1	155	63.05
Examination of Accounts	4,607	22.2	42	109.69
Investigation	3,513	16.9	27	130.11
Accountancy	894	4.3	18	49.67
Share transfer work	762	3.7	13	58.61
Services as company secretary	635	3.0	3	211.67
Receivership	250	1.2	1	250.00
No details	327	1.6	2	163.50
Total	20,760	100.0	261	79.54

Source: Price Waterhouse archive — Letter Book, 1897.

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[28] The smallest audit fee recorded in the Letter Book being £2 2*s*. 0*d*. for the annual audit of the Wingrove Steamship Co. Ltd.

From the details contained in the audit note for services rendered to Richmond (Surrey) Electric Light & Power Co. Ltd, it appears that the firm's daily charge-out rate in 1897 was two guineas. Details of the work carried out for the firm were listed as 'audit (5 days at £2.2*s* a day)'. The more widespread use of this charge-out rate is indicated by the £73 10*s*. 0*d*. charged ('for 35 days work') to Schroeder De Constans, and the fact that the other fees were generally multiples of two guineas.

While the two aforementioned railway companies were significant contributors to the firm's total fee income, these were exceptionally large audit fees, and well above the norm even for quoted companies. For example, from within the same industrial sector, the annual audit fees of the Brazil Great Southern Railway and the Lancashire, Derbyshire and East Coast Railway Company were just £31 10*s*. 0*d*. and £105 (comprising two half-yearly fees of fifty guineas) respectively.

Price, Waterhouse & Co. audited the accounts of several quoted breweries, and again we find considerable variation in the level of fees: Ohlsson's Cape Breweries (£50); Bartholomay Brewing Company (£52.10*s*); Star Brewery, Cambridge (£52.10*s*); Parker's Burslem Brewery (£125); Cannon Brewery (£105 for a six-monthly audit); and City of Baltimore United Breweries (£210 — audit in Baltimore and London).

Other sectors evidence the same variability in fees charged to quoted clients. The National Marine Insurance Association Ltd was charged an annual fee of just £45; the annual audit fees of the Santa Rita Nitrate Company and San Sebastian Nitrate Company were both a mere twenty-five guineas: Lawes Chemical Manure Company was charged £100 per annum, while the Northamptonshire Union Bank was charged £100 for a six-monthly audit. Van den Bergh's Margarine Ltd and Gordon Hotels were charged respective annual fees of £341 5*s*. 0*d*. (fee included accountancy work, though not share transfer work which was charged separately at £52 10*s*. 0*d*.) and £551 5*s*. 0*d*. (a billing of £315 in July and a further one for £236 5*s*. 0*d*. in August). Clearly there was great variation, both within and across industries, in the fees charged. Given the variety in the nature and scale of operations of quoted companies generally, however, this is unsurprising.[29]

The level of fees charged for audits of at least the larger organizations may be seen as indicative of the fact that the quoted company audit undertaken by a firm of professional accountants comprised a fairly full investigation. This conclusion can be backed up by contemporary comments from *The Accountant* concerning the nature and purpose of the audit (Chandler and Edwards, 1996). The balance of attention devoted by the auditor to the two principal audit objectives — the detection of error and fraud versus statement verifications — has fluctuated over time (Chandler *et al.*, 1993). The late-nineteenth century was a period when there was a growing emphasis on fraud detection which was not reversed until the Royal Mail Case, 1931. The scope of the audit was the subject of examination by the courts on a number of occasions in the last few decades of the nineteenth century, and legal actions against leading professional accountants might be expected to have raised professional awareness of the need to do a thorough job. Questions which were made the subject of careful examination in the professional press and leading textbooks of the time included: the extent of the auditors' duty to go beyond the books and examine the underlying records; the extent to which it was permissible to rely on systems of internal control rather than undertake a 100 per cent vouching of transactions; and the auditors' responsibility for the valuation of assets, liabilities and profit reported in the accounts (Chandler *et al.*, 1993, pp. 448–5; Chandler and Edwards, 1994). A company audit was clearly not considered a trivial affair by professional accountants, and we can infer from the contents of Pixley's authoritative text (1881) that the leading authority of the time believed that the professional audit, properly carried out, involved a thorough examination of the books, the underlying records and the company's published financial reports.

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[29] Further analysis reveals that over 25 per cent of the audit fee notes were for services rendered to non-corporate clients, such as partnerships, schools, hospitals and executors. Among the firm's non-corporate audit clients were University College, London; executors of Sir William Siemens; the Curators of the University Chest, Oxford; and the Hospital for Consumption and Diseases of the Chest.

CONCLUDING COMMENTS

The modern limited liability company formed by registration under the Companies Acts was created in 1855, but it was not until the 1860s that companies were floated in significant number. Altogether, 5,163 were registered between 1862 and 1869, 10,155 in the 1870s and 9,304 between 1880 and the date of this study (*The Stock Exchange Year-Book for 1920*). It is of course well known that many of these companies failed within a few years, and sometimes a few weeks, of their creation (see, for example, Shannon 1932–4). A relatively small proportion, though a significant number (1,100), had arranged for a Stock Exchange quotation by 1886, and we have succeeded in establishing the audit arrangements made by 960 of these.

We found that the vast majority (75.5 per cent) of companies covered by our study were audited by professionals, and almost all of these (99.2 per cent) were chartered accountants. An examination of the directories of six major cities suggests that a small number of additional companies were audited by public accountants not possessing a professional qualification.[30] We also found that, in addition to the 218 companies (22.7 per cent) who did not engage a professionally qualified accountant, a further 138 companies (14.4 per cent) arranged for a joint audit between a professional and, in the vast majority of cases, an amateur. The popularity of this hybrid arrangement indicates that the year 1886 was within the period that saw the major transition from the amateur shareholder auditor to the professional.

There is little evidence to suggest that size was an important factor in the decision to recruit a professional to carry out the audit function, with various tests revealing a

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[30] An examination of trade directories covering London, Manchester and Salford, Birmingham, Sheffield and Rotherham, Liverpool and Birkenhead, and Bristol and Clifton, identified just nine companies (4.1 per cent), from amongst the 218 companies not audited by professionals, to have engaged public accountants as their auditors. The accounting expertise of the auditors of the other 209 companies remains unknown. However, our sample of directories included all the cities in England where professional societies were established in the 1870s, and it is therefore likely that the vast majority of the auditors of these 209 companies were not accountants.

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significant departure from the overall average only in the case of the smallest 10 per cent of companies, where 60.4 per cent made this arrangement. Our study showed that companies registered under the Companies Act were, on average, much more likely to have their accounts professionally audited than those incorporated in other ways. This finding confirms our proposition that the amateur shareholder audit survived to a significant degree amongst the non-registered companies, though the move towards more formal audit arrangements was well under way by 1886. Given the fact that non-registered companies in most cases predated the registered category, it is perhaps unsurprising that a timescale analysis revealed that companies incorporated earlier were less likely to be the subject of a professional audit. Our final analysis, based on corporate structure, provided further confirmation for these findings by revealing that regulated companies (which contained a greater proportion of non-registered companies) were less likely to make provision for a professional audit.

This research therefore provides strong support for the idea that the market will ensure an adequate level of accountability in the absence of regulatory requirements. Moreover, in the case of quoted companies, that size is of little importance in reaching this decision. It is also clear that the existence of accounting regulations for particular industries appears not to have been a major spur for putting in place a professional audit, and we might imagine that the failure of the City of Glasgow Bank was the factor motivating banks subsequently registering with limited liability to make such provision rather than the Companies Act 1879. Indeed, the existence of statutory provision, to the extent it indicated the need to appoint a shareholder as auditor, may well have worked against the adoption of the professional audit.

In addition to the above, this study adds to our knowledge concerning the work undertaken by the late-nineteenth-century professional accounting practice and changes our understanding of its role in important respects. The bankruptcy-auditing thesis which sees insolvency work as the dominant source of revenue for professional practices up to at least the 1890s has been based principally on the impression conveyed by a literature dating mainly from the twentieth century, which was given further credence by Jones's (1981) analysis of the fee income of Whinney, Smith & Whinney and its predecessor firms. Subsequent investigations of the sources of revenue of professional firms undertaken by Walker (1993) and Cornwell (1993), together with the information presented in this paper relating to Price, Waterhouse & Co., suggest a broader spread of work than was previously imagined. It has been argued, here, that the fee income of Whinney, Smith & Whinney, mainly an insolvency practice, is atypical and we cite evidence from the contemporary literature to provide strong support for this conclusion.

The fact that professional firms were heavily involved in auditing work by the 1880s gains strong support from the data contained in Table 2, which implies that the vast majority of quoted companies' directors believed that the credibility of their companies' published accounts was enhanced by an audit certificate signed by a chartered accountant or firm of chartered accountants. These developments occurred in what was largely a *laissez-faire* environment. In circumstances where business failure was common and industry moved between periods of slump and boom, it is not surprising that directors should have been keen to reassure shareholders that every effort was being made to ensure that their company's resources were properly protected and that the information conveyed in the published accounts was reliable.

The growing interest in the financial and organizational affairs of quoted companies is evidenced by the appearance of publications such as the *Stock Exchange Year Book*, annually from 1876, *Burdett's Official Intelligence* (from 1882) and its successor the *Stock Exchange Official Intelligence* (from 1899). One might imagine that the voluntary decision to publish accounts and arrange for them to be audited by a professional was part and parcel of the same process designed both to inform and to reassure present and potential investors. The desire of the directors to formalize free-market arrangements by including provisions in articles of association for the appointment of a professional, who was sometimes named — initiatives not even contemplated by the model articles — was previously noted as the result of an investigation of the constitution of iron, coal and steel companies undertaken by Edwards and Webb (1985). We can imagine that a profession which has, over the years, proved its ability to capture areas of work not always associated with accountants seized with enthusiasm the opportunities provided by the growth of the capital market and the rapidly rising number of joint stock companies to apply their skill to an area central to their expertise, namely auditing. As the official history of Grace, Derbyshire and Todd puts it: 'We threw our net for business wherever we thought it would catch fish, or I should say make money' (Grace *et al.*, 1957, ch. 2).

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Corporate Governance: Lessons From Barings

The collapse of Barings plc at the end of February 1995 brought two official inquiries which reported very promptly. The British report was made public on 18 July, just over four months after the failure. The Singaporean investigation into the workings of the Barings subsidiary was completed at the beginning of September. Revelations about the events and courses of problems are colourful as well as damning. There are issues in corporate governance arising from this experience. However, an analysis of the workings of Barings plc is essential if substantial understanding of what took place and why is to be secured. The British report did not attempt such an analysis. This oversight hampered analyses of the handicaps to effective funds and risk management as well as failure to develop informative and accurate accounts for auditing, credit control and funding purposes. The governance implications are treated exhaustively.

Key words: Barings; business failures; corporate governance; derivatives; futures.

At the end of February 1995 the Barings Group failed with losses estimated at that time to be about £927 million. This startling collapse led to prompt official investigations. In London the Bank of England (BE) bore most responsibility as the supervisor of the parent bank and the lead regulator of the Barings Group which handled asset management and securities trading as well as banking, by agreement with the Securities and Futures Authority (SFA). In Singapore, where the financial disasters occurred, the official investigation was directed to Barings' activities in futures contracts which were conducted through a subsidiary, Baring Futures (Singapore) Pte Ltd (BFS).

The main thrust of this contribution is to examine one facet of the circumstances surrounding the collapse of Barings plc, namely the implications and lessons for corporate governance. Inevitably, this appraisal will draw attention to other features and implications of the collapse. Many of them have been treated in a larger presentation (Hogan, 1996).

Interest in the swift collapse of Barings plc, especially from a corporate governance perspective, is in whether or not there was novelty in the explanations for what took place. Collapse of major corporate entities is not a new phenomenon. There are any number of examples sufficient to allow a significant classification of types of experience (Miller, 1990). Then there are specific case studies such as that of

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the Equity Funding Corporation of America, a large insurance and securities company, which collapsed in the first quarter of 1973 to reveal comprehensive failure over many years to report accurately on its true financial condition (Seidler *et al.,* 1977). Hence the fascination with Barings lies in what is revealed about management practices and control.

Most interest in the two reports is for their clarification of what took place to bring about the financial destruction of a well-known banking group.[1] The first one was provided in July 1995, being the Report of the Board of Banking Supervision Inquiry into the Circumstances of the Collapse of Barings. This board is associated with the Bank of England but has independent members who, as a group within the board, may report separately on items referred to them except that judgments and recommendations on the quality of supervision by regulators such as the BE and SFA, are those of the independent members alone. This report to the House of Commons in the United Kingdom was completed on 13 July and made public on 18 July when the House ordered it to be printed. The investigation was directed to the activities of the Barings Investment Bank (BIB) rather than the Barings Group in its entirety (BE1.10). The BIB was the creation from a major restructuring of the banking and securities businesses within the Barings Group initiated in 1992 and still not complete at the time of the collapse. Yet the lack of attention to the Barings Group as a whole seems to have impaired understanding of what had been taking place.

The second report was undertaken by two partners of Price Waterhouse Singapore at the direction of the Minister for Finance in Singapore under the provisions of Section 231 of the Companies Act in that country. The investigation was completed and transmitted to the minister on 6 September 1995, nearly two months after the London contribution. The Singaporean investigation was strictly an assessment of what happened in Baring Futures (Singapore) Private Limited (BFS), which was the operating company dealing on the Singapore International Monetary Exchange Limited (SIMEX) in conjunction with the Osaka Securities Exchange (OSE) when trading Nikkei 225 futures contracts, the Tokyo Stock Exchange when trading the ten-year Japanese Government Bond (JGB) futures contract and the Tokyo International Financial Futures Exchange when trading the three-month Euroyen futures contract.

Even more so than the British report, the two investigators in Singapore were directed to the specific circumstances surrounding BFS and not the Barings Group. Despite the apparent common interests of both sets of investigators, the extent of cooperation secured for reciprocal enlightenment was not comprehensive. Legal impediments to the granting of access to information were substantial in both countries (BE1.74 and SR1.20).[2]

[1] Reference to the two reports throughout the text will be by paragraph number. The British reference will be 'BE2.60', in this case when quoting from Chapter 2, paragraph 60. With the Singaporean references they will appear as 'SR3.62' when in this case referring to Chapter 3, paragraph 62. When the Executive Summary of the Singaporean report is a reference, then the notation will be 'SR.ES4' when referring to the fourth paragraph in that summary.

[2] Some of the problems and issues are spelt out in appendixes to the two reports. Appendix XIV of the British Report is helpful for its treatment of matters related to the Basle Concordat. Appendix IE of the Singaporean Report lists what took place between the various parties involved in investigations and administering the failed company.

The analyses offered in the two reports are extended here to an appraisal of recent annual reports and financial statements of Barings plc, the parent company in the group. This effort is directed to an understanding of how the various Barings companies were organized and what the financial conditions had been in the years immediately prior to the collapse. The significance of this extension lies in the lack of any appraisal of the Barings group as a whole in the British report.

The material available in the two reports of investigations into the collapse of the Barings Group as well as public documents of the company provides many insights about issues in corporate governance. The great bulk of the literature in this sphere is about principal–agent relationships between equity holders, debt holders and managers. The conditions under which these issues arise have been spelt out recently (Hart, 1995). The main elements in the conditions are the existence of conflict of interest, or potentially so, between members of an organization and then the difficulty of resolving those conflicts by written contracts. The problem with contracts is the cost of writing in all eventualities and, worse still, identifying what they may be. Without that full identification then contracts are incomplete. With incomplete contracts and the different interests generating principal–agent problems, then there is a corporate governance issue. The fiasco within Barings plc offers great scope for analysing this issue.

EVENTS

Trading

The origins and purpose of Barings' operations in future and options contracts between Singapore and the three exchanges in Japan was to pursue a trading strategy arbitraging baskets of shares or bonds in the cash market (for the underlying securities) against the Nikkei Index Futures or the ten-year Japanese Government Bond. This developed further with trades in the three-month Euroyen futures contract.

BFS was incorporated in Singapore on 17 September 1986. On 31 October 1986, BFS applied for membership of the Singapore International Monetary Exchange (SIMEX) as a corporate non-clearing member and such membership was subsequently granted. However, BFS did not commence trading immediately. The upgrading of BFS's SIMEX membership was fostered by the needs of the agency futures and options business that had been built up over a period of years by the sales team from Baring Securities Japan (BSJ). Initially, it seems to have been intended that BFS's role would be limited to the clearing and settlement of SIMEX trades undertaken for BSJ's clients. However, this was extended to actually executing such trades on SIMEX. Such execution was, however, at the direction of the dealers in Japan.[3]

On 21 February 1992, BFS applied for upgrading to corporate clearing membership of SIMEX. This was granted and then, on 1 July 1992, BFS commenced trading on SIMEX. Mr Leeson was registered as a seat holder that day, as well as one of two registered traders on the floor. He was put in charge of operations for BFS with responsibilities for both trading and the accounting and settlements activities from the outset. The only possible explanation for this gross flouting of basic rules of separation between the two functions was the belief about Leeson and his staff merely executing orders from Tokyo and London.

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[3] A glossary of terms used in financial markets is listed in the Appendix.

The arbitrage was undertaken between the cash baskets traded in the Tokyo Stock Exchange and Nikkei futures traded on the Osaka Securities Exchange. In 1992, the BSJ traders decided, with a view to reducing costs and increasing profits, that the Nikkei 'cash futures arbitrage' activity should be shifted to SIMEX, where margin requirements were more in line with standards of major international exchanges.[4] This was especially true of Nikkei futures, where the initial margin deposits required by the OSE at the time amounted to 30 per cent of the face value of the contract as opposed to 15 per cent on SIMEX.

In order to shift such arbitrage activity from OSE to SIMEX, the BSJ traders had Leeson execute Nikkei future trades on SIMEX. In time, Leeson was given by them the responsibility of trading increasing volumes of Nikkei futures on SIMEX. By early 1993, Leeson was already involved in executing orders on behalf of the proprietary traders as well as dealers handling the agency or client business.

These experiences allowed a general operating arrangement to evolve whereby price differentials for the Nikkei 225 futures contract between SIMEX and the Osaka Stock Exchange (OSE) were arbitraged. This selection of the more profitable location of the two to do business was referred to as 'switching'. The same type of activity was pursued between SIMEX and the Tokyo Stock Exchange (TSE) for the JGB futures contracts (SR3.6). It was not until 16 June 1994 that intra-day trading limits were laid down for trading the various contracts to cover temporary open positions inevitable when arbitraging two markets with different characteristics in respect of liquidity and volatility. Moreover, the so-called facilitation service whereby BFS quoted a price to clients for a contract or portfolio of them and then determined where to trade them was a short-term open position, proprietary trading in other words.

There is no question about the profitability recorded by the Structured Products Group of which Leeson's trading formed the major part. However, the JGB futures contract switching activities seemed to have earned twice the revenues of the Nikkei 225 futures contract in 1994 (BE3.54 and Figure 3.4). What all these activities meant for the Barings Group is clear. The operating profit in the Structured Products Group was not just five times what had been planned for 1994 but was equal to the total operating profit in the 1994 budget for the entire Barings Group.[5]

What is surprising is the lack of serious questioning of an operating profit some five times greater than had been planned in the annual budget. Barings were held to have a preferred position in the market with a reputation for skill amongst clientele in a business with little or no credit and market risks (BE3.58–3.60). There seems to have been no recognition of arbitrage being a process whereby price differentials for the same item between two markets are eliminated and with that, profit opportunities. This inability or unwillingness to question the validity of these earnings seems to have stemmed from Leeson's favoured status arising from his contributions to the bonus pool (SR8.3, footnote 123). His importance was enhanced (SR12.21 and BE7.12).

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[4] A cash basket consists of all the component stocks of the Nikkei 225 Stock Average Index ('Nikkei') executed in a package. The arbitrage activity entailed the purchase/sale of cash baskets against simultaneous sale/purchase of Nikkei futures to take advantage of price differentials. This was referred to as 'cash futures arbitrage' (SR2.10).

[5] The expected operating profit set down in the 1994 Budget was £8.3 million for the Structured Products Group and £39.3 million for the Bank Group. The actual operating profit in the Structured Products Group was recorded as £40.6 million.

Accounting and Settlement

On 3 July, just two days after he commenced trading on SIMEX, Leeson opened Account 88888 which was listed as an error account in BFS records. On or around 8 July Leeson gave specific instructions to change the software program to exclude Account 88888 from all market activity reports other than the margin one which went to SIMEX for obvious reasons of estimating margins requirements (BE5.3 and SR.ES17iii). But the activities in that Account were not presented to the London accounting and settlements offices.

Thus the steps taken by Leeson in the first days of responsibility for activities of BFS were to ensure the means by which his actions would not be transparent. Reporting lines to settlements and accounting staff in London were impaired. Funding requirements for business activities tied to contracts traded on SIMEX were not open to inspection because margin calls on futures and options contracts were based on data not available directly anywhere else in the Barings Group. All this was made possible because Leeson was in charge of trading and all accounting and settlements matters.

Management of an increasingly challenging funding situation while enhancing the profitability of trades for the Barings companies, mainly BSL, BSLL and BSJ, was achieved by a set of manipulations of the trading and accounting records which may be described in summary:

1. Most transactions eventually booked in Account 88888 were initially recorded in the accounts of BSJ or BSL. If correctly reported to BSJ or BSL, it would have been apparent that risk limits had been exceeded since such transactions were not hedged. The disclosure was avoided by offsetting trades about thirty seconds before the close of business on SIMEX to place transactions from the BSL or BSJ accounts to Account 88888.
2. The prices of these transfer trades were later adjusted to favour BSL or BSJ even when this involved complicated alterations between different sets of records (SR3.24).
3. Fictitious trades between these accounts were recorded in the BFS daily list of transactions when no such trades had been executed. Their effect was to transfer unhedged positions from the BSJ or BSL accounts so that no unhedged positions were reported at the end of each day.
4. Settlements staff were required to record fictitious trades in the accounting system one day and reverse them at the opening of business the following day with the sole purpose of reducing open positions in Nikkei and JGB futures thus curtailing the margins call from SIMEX (SR3.37).

Management Failure

Most remarkable was the failure of London management and settlements staff to reconcile the calls for funds to meet margins requirements at SIMEX with the recorded transactions in futures and options on behalf of clients. From the middle of 1994 the most serious misgivings about this inability to reconcile client trades with funding requests were expressed (BE6.83–6.86). Problems may have been known a year earlier. These concerns were a major item for the internal audit investigation in Singapore during the second half of 1994.

The failure to reconcile the funding sums sent to BFS with the accounting and settlement records for clients' trades meant that there was an unexplained amount. This was listed under the heading 'loans to clients' but not allocated to any one client (SR9.4 and BE6.76). However, this category of loan was not subject to review by Barings' credit control system because it was not applicable to specific clients; credit monitoring went by default (SR11.11).

One explanation given for the burgeoning claims for funding was the need for financing 'advance margin calls' which were intra-day margin requirements imposed by SIMEX owing to volatility in prices of the relevant contracts (SR3.43 and BE6.24–6.33, 6.83–6.85). The extraordinary features of this explanation are that it was used to extract additional funds from both BSL and BSJ and was never questioned. Yet such reasoning was plainly wrong because the need for funds would have been stabilized or reversed when contract prices stabilized and volatilities did not increase, or should prices and volatilities have declined. No attention appears to have been given to circumstances in which the funding calls should have been reversed.

It is well to realize just what was the scale of funding being sought from and supplied to Singapore. This is shown in Table 1. At the end of 1994 the cumulative funding amounted to more than half shareholders' funds of Barings plc.

TABLE 1

CUMULATIVE FUNDING OF BFS
(£ millions)

Company/Date	7 Jan. 94	31 Dec. 94	24 Feb. 95
BSLL	7	13	105
BSL	33	142	337
BSJ	(1)	66	300
Total	39	221	742

Note: BSLL is Baring Securities (London) Ltd;
BSL is Baring Securities Ltd; and
BSJ is Baring Securities Japan.
Source: BE6.20

Review

The main general conclusion offered in the British report is directed to failure of management to understand and detect activities being conducted within the group:

> This collapse was brought about by the unauthorised trading activities within BFS—one overseas subsidiary within a large group but whose activities accumulated losses of around £830 million and caused the ultimate parent company, Barings plc, to be placed in administration. The collapse of Barings is an illustration of how a viable and prosperous group can, in circumstances where controls are ineffective, be brought down by unauthorised activities within one of its subsidiary operations. (BE13.80)

This collapse is to be explained by the lack of effective internal management techniques in Barings: 'the system of checks and balances necessary for the proper management and control of a financial institution failed in the case of Barings with regard to BFS in a most serious way, at a number of levels and in more than one location' (BE13.80). Yet the British report failed to examine the workings of Barings Group management as a whole rather than the major subsidiaries involved directly (BE1.10). The report could not be certain that there were no other parties acting in concert with Leeson.

That qualification is the setting for the Singapore report. The thrust is more damning than the British one. The investigators recognize management failures but question this repetitive failure to check thoroughly as credible. The Executive Summary to this report is the set of conclusions with two of the three closing paragraphs devastating in commentary. The first of these spells out the chain of successive failures to act to stop the contagion of unauthorized business. The long paragraph from that summary reads as follows:

> In retrospect, it seems probable that until February 1995, the Baring Group could have averted collapse by timely action. By the end of January 1995, although substantial losses had been incurred, these were only one quarter the eventual losses. In our view, if:
>
> (i) the growing difficulty in reconciling Mr Leeson's funding requests (which had persisted as a problem concerning BFS since, at least, June 1994) had been thoroughly and promptly investigated; or
>
> (ii) steps had been taken to overcome the inability of Group Treasury and BSL Settlements since, at least, June 1994, to understand BFS's margin calls; or
>
> (iii) ...(vii)
>
> (viii) the reasons underlying the requests for very large amounts of funds by Mr Leeson in January and February 1995 had been analysed and understood,
>
> the collapse could well have been averted. Hence, whether the Baring Group management in fact knew of Account 88888 is hardly crucial. If they did not know of it at the outset, they would have learnt of it once they undertook any of these steps to investigate the position. They could have remained ignorant of the account up to the time of collapse only if they had persistently shut themselves from the truth. Mr Norris's explanation after the collapse, namely that the senior management of the Baring Group believed that Mr Leeson's trading activities posed little (or no) risk to the Baring Group, but yielded very good returns, is implausible and in our view, demonstrates a degree of ignorance of market reality that totally lacks credibility. (SR.ES36)

What may be overlooked in both reports, though more particularly the Singapore one, is the loss of focus on the management of day-to-day activities as the consolidation of Barings Securities and Barings Brothers into the Baring Investment Bank was pursued through 1993 and 1994. In circumstances of comprehensive restructuring, as was the case in Barings, and the very weak performance of Barings Securities in the beginning years of this decade which had led to the decision for consolidation, an emphasis on short-term performances to preserve jobs would be inevitable. Leeson's highly successful efforts in Singapore would have been a heaven-sent opportunity to restore the corporate worth of Barings Securities. In this way the new leaders of the restructuring and Barings Securities would have been proving their value. Given these circumstances, all too familiar to many in financial services activities around the world, critical faculties essential for risk appraisal and control may have been dulled.

THE BARINGS GROUP

While the two official reports tell much about activities of Barings plc and its banking and securities subsidiaries, little is stated about the ways the group was organized and managed its activities. In view of the circumstances which led to the collapse, it is important to understand how revenues and profits were earned and in what locations. No less important is the organizational structure of the group and the respective roles of shareholder and management.

Revenues, Profits and Capital, 1989–93

Information on profitability and capital in the Barings Group over the five years to 1993 is shown in Table 2. A note of caution must be entered about interpretation of the data from one year to another. Changes in accounting standards on reporting in financial statements may make for difficulties with year on year comparisons. However, at Barings this problem of comparison may be exaggerated because the 1993 Annual Report and Statement of Accounts for Barings plc is unequivocal in stating how, 'the Group has changed the presentation of some of its accounts; comparative figures have been restated accordingly' (Barings plc, 1993, p. 25). This restatement of accounting data did not apply to assets so that asset figures for 1992 and 1993 are not directly comparable with earlier years (Barings plc, 1993, p. 7).

The period between 1989 and 1993 covers years of acquisition and restructuring. A harsh financial and business environment bore heavily upon investment banking and securities dealing during 1991 and through much of 1992. These experiences led to the decision to amalgamate these activities within a new Barings Investment Bank group. Earnings during these five years were volatile, with two years—1989 and 1993—producing profits, before or after taxation and minority interests, that were a high proportion of shareholders' funds. On the data shown in the table the profit before and after taxation and minority interests was 36.2 per cent and 22.0 per cent respectively of shareholders' funds in 1989, and 32.4 per cent and 22.0 per cent respectively in 1993. These high earnings were in contrast to other years with much lower earnings relative to capital; for example, the same two ratios were 8.35 per cent and 4.96 per cent in 1991. This volatility in the returns on shareholders' funds is striking *ex-post,* but arguably equally so at the time. The sharp variations from year to year might reasonably be understood as indicators of exposure to risk.

TABLE 2

BARINGS PLC, 1989–93
(£ millions)

Years ended 31 December	1993	1992	1991	1990	1989
Profit and loss account					
Profit before taxation and minority interests	100.1	21.2	42.5	42.4	65.9
Profit after taxation and minority interests	68.0	12.6	26.5	21.1	40.0
Retained profit for the year	54.3	1.8	19.1	14.8	34.2
Capital resources					
Share capital	117.8	117.8	77.8	37.8	37.8
Reserves	191.0	136.1	180.8	155.6	144.0
Total shareholders' funds	308.8	253.9	248.6	193.4	181.8
$150 million capital notes	101.3	99.9	88.1	77.8	93.1
Total	410.1	353.3	336.7	271.2	274.9

Source: Barings plc (1993), Annual Report and Financial Statement, p. 7.

There are estimates available for 1994 being the unaudited accounts. When the concealed losses in Account 88888 are taken into calculations, then the results for 1993 should also be amended (BE8.1–8.3 and Figure 8.1). Thus in 1993 the profit before tax would be adjusted downwards to £89.6 million and the profit after tax of £57.8 million. Shareholders' funds would have been £297.3 million, a huge fall on the £410.0 million recorded in the 1993 Financial Statement.

With the unreported loss through Account 88888 of £185 million in 1994, those shareholders' funds should have been reported as £250.4 million. Given that further drop through 1994, it is easy to appreciate how the 'final' situation could not be met by Barings at the end of February 1995.

Prior to discovery of Account 88888, the expected results to be reported for 1994 were profits before tax of £102.4 million and after tax of £63 million. However, with the Account 88888 adjustment this was turned into £9.9 million before tax and an after tax loss of £29.5 million. And all this was before the maelstrom of January and February 1995!

Given the many qualifications to be entered about comparisons from year to year in the accounts of Barings plc and the sharp changes in accounting practices between 1991 and 1992, it is not possible to draw substantial conclusions about liquidity. The liquidity of the group balance sheet was falling between 1989 and 1991. This is shown in Table 3 for two liquidity ratios. This decline would be even clearer were earlier years than 1989 taken into consideration. While the break in series between 1991 and 1992 is a severe handicap to understanding most recent experiences, the trend in liquidity appears to have been downward for some years.

There may well be further reasons for caution when comparing changes from year to year. Until 1992 certainly, the accounts of merchant banks like Barings were

TABLE 3

BARINGS PLC; BALANCE SHEET RATIOS, 1989–93

Ratios (%)	1993	1992	1991	1990	1989
Liquid assets/total assets	11	6	32	36	40
Liquid assets/deposits	21	11	47	51	67
Net profit/total assets	1.08	0.25	0.64	0.57	0.99

Source: Barings plc, Annual Reports and Financial Statements, various years.

circumspect about disclosure of reserves. However, the reserves were insufficient to meet the losses in February 1995 so that claims about large hidden reserves seem badly misplaced. Barings collapsed in a few days because it could not fund the margins calls from SIMEX.

The information in Table 4 compares the structure of earnings in 1992 and 1993. Distinction is drawn between 'Fees and Commissions' and 'Dealing Profits' though other sources of revenue are shown in the Barings accounts. The earning of fees and commissions stems from activities including the purchase and sale of securities and their derivatives on behalf of clients. Dealing profits arise when taking position in markets on behalf of Barings as principal. The so-called proprietary trading and the provision of facilitation services would be the main sources of these earnings.

TABLE 4

INCOME ITEMS
(£ thousands)

	Fees and commissions	Dealing profits
1993		
U.K.	168,866	112,187
Other Europe	37,932	271
North America	26,717	1,223
Asia/Pacific	143,575	35,814
	377,090	149,495
1992		
U.K.	137,692	49,329
Other Europe	22,272	2,375
North America	16,909	4,682
Asia/Pacific	94,867	8,864
	271,740	65,250

Source: Barings plc, 1993, Annual Report and Financial Statement; p. 26.

Between 1992 and 1993 revenue as fees and commissions rose by 38.8 per cent, of which the Asia/Pacific share went from 34.9 per cent to 38.1 per cent. In contrast, revenue from dealing profits rose by 129.1 per cent. Asia/Pacific earnings in the category rose 304.0 per cent. It is likely that the revenues earned by the Asia/Pacific group were not confined to the region alone because tax advantages might accrue by booking the trades against a Barings company domiciled in London.

The Asia/Pacific region dominated profitability in the Group. The data in Table 5 are all too revealing of this phenomenal performance. Profits before tax amount to £45,987,000 out of a £105,184,000 total, or £100,103,000 when interest on capital notes is deducted. The calculations show just how reliant the Barings Group were in 1992 most of all but also in 1993 on the profitability of the Asia/Pacific region. Is it little wonder that Barings management was so keen to expand operations in Singapore? In 1994 there were losses on United Kingdom operations where 73 per cent of the net assets were held. The Asia/Pacific region was the main source of earnings that year. By 1993 that proportion had fallen to 64.8 per cent as more assets were committed in Asia/Pacific activities to support the apparently profitable expansion in banking and securities dealing.

Ownership and Management

The information on earnings and asset utilization by total and region shown in the immediately preceding tables helps to explain some changes initiated in 1992. The major change in strategy was to amalgamate banking and related activities of Baring Brothers and Co. Ltd (BB&C) with the securities dealing activities of Baring Securities Limited. This was announced in 1993 and pursued throughout 1994

TABLE 5

PROFITS AND NET ASSETS, 1992 AND 1993
(£ millions)

	1993		1992	
Region	Profits	Net assets	Profits	Net assets
U.K.	35.889	265.860	–5.726	258.432
Other Europe	13.542	18.438	2.975	14.273
North America	9.766	47.362	5.123	45.128
Asia/Pacific	45.987	79.046	26.150	36.506
Rest of world	–	–0.609	–0.608	–0.517
Total	105.184	410.097	27.914	353.822

Note: Profit includes interest paid on capital notes and before taxation and provision for minority interests.

Source: Barings plc (1993), Annual Report and Financial Statement, p. 27.

though the initiative for the change was taken a year earlier (BE2.15). The two groups of activities were to be combined under the Barings Investment Bank (BIB).

Explanations for this strategic switch lay in the difficult market conditions experienced in corporate and international finance from 1991 onwards as well as in capital markets and related treasury activities. At this time the prospects for broking and securities dealing had worsened, with increasing competitive pressures not just in Europe but also in Japan and other Asian markets.[6]

However, the joining of these two separate entities was a difficult task. The banking side had a formal management structure supported by an established internal audit (BE2.6). The dealing functions under BSL were subject to few formal procedures with an ineffective management committee, a risk committee introduced late in 1993 was of little significance and there was no internal audit function (BE2.10 & 2.12).[7]

An examination of the corporate structure within the Barings Group shows the extent of the challenge to bring cohesion amongst its disparate entities. In 1991 the Board of Barings plc had twelve members, of whom five were non-executive directors. Of the three main operating companies two of them had huge boards. BB&Co had thirty-nine members though there was a management committee of about ten. Barings Securities Limited (BSL) had forty-six members of the board, of whom three were non-executive directors. A board management committee had four or five members. Only Baring Asset Management Limit had a relatively modest-sized board with eighteen members. It is hard to judge just how the responsibilities of directors could be exercised in such situations and, for the two companies with very large numbers, just how meetings were organized to allow this exercise if at all. By the end of 1993 some progress had been made in whittling down the numbers on the BSL board.

A reasonable interpretation of the role of boards in the Barings Group would not support their role as being one for detailed scrutiny of strategy and operations. Even where board committees existed there is no strong evidence suggesting reviews of operations were encouraged. There were no committees separate from management to provide checks upon their conduct; the glaring omission relates to audit.

Examples of failure to pursue queries are well recorded. There is all the material in the previous section listing management failures to pursue issues and check on implementation. The most striking example of this last-mentioned feature was the failure to implement a recommendation from an internal audit report of August 1994 to separate the trading and settlement functions from the settlement ones in BFS (SR5.18–5.20).

If the board and management structure were ill-suited to swift adaptation of the Barings Group to changed market conditions and new earnings opportunities, there were other features of the Barings Group which could well have influenced performance. Barings Group was unlike a corporate entity with shareholders who have a potential capacity to monitor management. The great bulk of the equity capital was held by the Baring Foundation, a registered charity in the United Kingdom (Barings plc, 1993, p. 2). That equity was non-voting. The voting share capital of Barings plc was held by its senior management of which there were 100 shares at £1 on issue (Barings plc, 1993, pp. 2, 34). In effect the basis of corporate governance in the Barings Group was not that of a listed public company but more akin to the workings of a mutual not subject to normal equity disciplines except that there were no policyholders or depositors with voting rights.

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[6] See Barings plc, Annual Report 1991, pp. 5, 10–16; Annual Report 1992, pp. 6–7, 10–13.

[7] An internal audit function for BSL is shown in an organization chart as at 31 December 1992 but having no independent reporting role. Moreover, this schema was constructed after the event for the British investigation. (BE, Appendix X)

The senior management in the Barings Group determined the fate of all. They held the voting equity. Non-executive directors were, in any meaningful sense, purely advisory as they were present by grace and favour of voting equity holders. Senior management set the tempo of the Group and nowhere was this more evident than in the reward structure. The thrust for earnings was embedded in the reward structure of the Barings Group. In 1993, with the surge in profitability, the highest paid director received a profit share bonus more than six times remuneration. On average that bonus was nearly four times remuneration for the company directors. This type of bonus extended to all executives of the main subsidiary companies (Barings plc, 1993, pp. 29–30).[8]

The total bonus pool for the Group in 1993 was about £100.1 million (BEFigure 8.1). This is based upon the policy of estimating the bonus pool as 50 per cent of the national profit before bonus, tax and minority interests. This compares with an estimated bonus pool of £21.3 million in 1992, of which £1.5 million went to the company's directors. At least as much money would have gone to senior executives being members of the board of the major subsidiary companies. Furthermore the salary of directors as distinct from their bonus had been reduced in 1993 compared with 1992 (Barings plc, 1993, p. 29). A reasonable assessment would be that by 1993 senior and middle ranks of management in the Barings Group were highly dependent on the bonus pool for their incomes (BE2.90–2.92).

It may well be that judgment exercised by management was not influenced by the scale of bonus payments. This is the view expressed in the British report (BE2.93). However, there was little in the reward structure to counterbalance the prompt bonus payments in terms of ensuring verification of the earnings not being subject to costs revealed only some time later. In addition to the bonus, directors and senior management could defer a specified percentage of the bonus by payment into a Share Option Plan for investment into the capital of Barings Group Holdings Ltd. These funds could be released after three years, at which time they would count as part of total emoluments and be subject to tax. This plan was introduced in 1993 as Barings' board tried to devise an efficient bonus structure. This last-mentioned feature was the only element in this reward system which bonded the recipients to the medium-term prospects of the Group. However, the total sum set aside under this provision in 1993 was less than the bonus received by the highest paid director. Hence, the bonding element was minuscule in the total reward structure.

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[8] A survey of some recent executive compensation schemes shows a variety of performance measures (Conyon *et al.*, 1995).

The debacle which engulfed Barings cannot be understood without account being taken of the equity voting provisions, corporate structure and a reward system determined by senior management. There was no effective guardian of the equity interests to question whether or not the earnings were being pursued regardless of the exposures to risk.[9] As shown, the volatility of earnings and profits were signals of relatively high risk. The internal reward structure was unimpeded in the emphasis it gave to expanding earnings.

IMPLICATIONS FOR CORPORATE GOVERNANCE

As stated at the outset, one major aim of this assessment was to consider the economic and financial implications of the collapse. In order to pursue the matter some conclusions must be drawn between the three categories of influence referred to in the second paragraph at the beginning; those arising from the market, those from within the Barings Group itself, and by actions of supervisors.

There is no evidence that market conditions and the instruments used for participation were a source of difficulty. The collapse of Barings had little to do with the use of derivative financial instruments, in this instance futures and options contracts. That derivatives were traded is not in dispute. There was nothing in the trading activities which would suggest the use of complicated, interlocking transactions. In short, derivatives had little bearing on the collapse.

What is not contentious are the sources of the undermining of the Barings Group. This stemmed initially from unauthorized and concealed trading activities and not from the instruments used. Contributing greatly to this downfall was the failure of management in its monitoring and analysis of trading activities and the risks associated with them. Ineffective management was endemic, as witnessed by repeated failures to deal with problems as spelt out earlier. Some features of these repeated shortcomings do point to links between earnings and bonus contributions despite the contrary conclusion in the British report. Then there is the corporate structure with the absence of monitoring by voting equity holders.

The failure to detect the existence of Account 88888 and the ways in which it was being used for unauthorized trading are very reminiscent of the sources of failure in the Equity Funding Corporation referred to above. Interestingly there the 'secret' account referring to 'fictitious' insurance policy holders was described as the 'Department 9999' account.

There are no grounds for thinking that the regulatory authorities contributed to failure. The misplaced generosity in waiving the 25 per cent limit in exposure of capital to any single lending source was taken advantage of beyond the original commitment. The failure to clarify and then understand the full effects of the consolidation of accounting into the Barings Investment Bank was an error in principle. In practice the inefficiencies of Barings' accounting, recording and settlement systems meant that data supplied to the leading supervisor was defective and not revealing of the true condition of the Group and would, in all likelihood, have remained so whatever the Bank of England had laid down. A slim possibility exists that, had the accounting issues with consolidation into BIB been explored fully, then Barings would have been forced to attain greater efficiencies and accuracies in the workings of their internal systems.

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[9] The importance of remuneration committees comprising independent, non-executive members of the board has been stated time and time again (Conyon *et al.*, 1995, p. 713).

Role of Shareholders

A major issue in corporate governance relates to the role of shareholders in monitoring and rendering accountable the directors and management of any one company. What has changed over the past quarter century in the appraisal of corporate ownership and control matters is the growth in institutional share ownership. A major survey of empirical results undertaken in 1988 provides a helpful basis for any assessment of the role of shareholders (Jensen and Warner, 1988). This treatment establishes a benchmark from which more recent appraisals may be analysed. The main points may be stated:

1. Share ownership can be an important source of incentives for management, boards of directors and major shareholders not represented on the board.
2. Managerial share ownership and control of voting rights influence a firm's attractiveness as a takeover target, as does the debt/equity ratio. Managerial resistance to takeover takes many forms though few hostile offers succeed once management is allowed to put in place its defensive measures. This brings statistically significant losses of wealth to the shareholders in companies where the takeover bid is thwarted.
3. How common stock voting rights are specified also influences corporate behaviour and shareholder wealth. Theoretical analyses indicate that in certain situations departures from one share/one vote can increase firm value by enabling shareholders to capture the benefits of control from the winning bidder in a control contest. Under such governance rules, however, the best management team is less likely to win control, and this reduces economic efficiency.
4. Evidence on management actions taken to forestall takeovers is inconsistent with the view that management always acts in shareholders' interest. The immediate wealth effects of successful defence against a hostile bid are negative.
5. There is some evidence for changes in senior management to be associated inversely with changes in the share price of the company.

While much of this evidence rests upon experiences in the United States, there is sufficient to point to what the absence of equity ownership could mean for the effectiveness of the group. The absence of questioning by outside shareholders is likely to have bred a complacency towards effective management in the Barings case.

Ownership Structure

Concentration on relating ownership structure to managerial performance and share price premiums offers some insights. An empirical analysis based on a sample of 511 companies in 1980 was drawn from major sectors of the United States economy. Hence it is a much broader study than the previous one about banking. The main thrust is to explain differences in ownership concentration across firms in terms of their value maximizing size, control potential, and the presence of regulation (Demsetz and Lehn, 1985). On size, the authors argue that the larger the firm the more diffuse ownership structure may be because of the existence of a wealth constraint and risk averse behaviour of individual investors, and because it is easier to get control in large firms with a smaller proportion of the shares than in smaller firms. Control potential relates to the profit to be gained from exercising more effective control over management behaviour and hence relates directly to the presence of agency costs. In general, the greater the uncertainty in the firm's operating environment, reflected in profit instability, the greater the likelihood of agency costs and the greater the pay-off to owners in maintaining tighter control. Finally, they argue regulation is a substitute for owner-based monitoring and hence regulated industries may experience more diffuse ownership structures.

The profit instability theme is probably the most important of all the points made here about types of ownership and what this means. The lack of any worthwhile guardians of equity was the strongest pointer to the possibilities of high agency costs. At Barings there seems to have been a lack of awareness of what signals should have been looked for.

Influence of Non-Executive Directors

The hypothesis that the market for corporate control and a 'strong' board of directors which is independent of management are substitutes, in that they each provide a means of monitoring agency costs arising from non-profit maximizing behaviour of management, may be tested. The strong board in this setting comprises non-executive directors. Findings are consistent with the hypothesis that the market for corporate control, use of outside directors, and concentrated ownership are means of controlling managerial behaviour but are not perfect substitutes (Williamson, 1983). However, a difficulty in the empirical analysis is controlling for other factors which may bear upon the use of outside directors or ownership concentration.

A provocative study of tender offer bids casts light on the contribution of outside directors to the wealth of the bidding firms (Byrd and Hickman, 1992). The study distinguishes between outside directors being independent of any affiliation or association with management and those with some business ties to the firm. The study examines 128 tender offer bids made between 1980 and 1987.

The results point to the important role of independent outside directors in monitoring the bidding of management in takeovers. This is the case where at least half the members of the board are independent outsiders. This monitoring role is dominant; tests of managerial quality as a restraint on excessive tender bidding do not show any significant contributions.

Institutional Investors

Recent tests of the influence of institutional investors in the United States are revealing. One investigation was about the voting behaviour of 201 institutions on anti-takeover amendments put forward by management (Brickley *et al.,* 1988). Significant differences across the various types of institutional investors were recorded. The evidence suggests that mutual funds, endowments, foundations, and public pension funds are more likely to oppose management than banks, insurance companies, and trusts. The latter group comprise firms frequently deriving benefits from lines of business under management control. Management of some institutions may face clear conflicts of interest between their fiduciary responsibilities to depositors, beneficiaries and owners of trust funds, and other objectives such as value maximization for the owners of the institution.

Other aspects of this study were no less interesting. Perhaps not surprisingly, institutional opposition is greatest when the proposal reduces shareholder wealth. However, the relation between institutional share ownership and the percentage of yes-votes cast does not vary with the sign of the market reaction to the proposals.

Legal and Institutional Themes

Perennially economic and financial analyses point to the role of information in the efficient conduct of financial markets.[10] Hence, fundamental to the traded equities approach to corporate governance is reliance upon market disciplines to secure optimal performance which, in terms of the efficient market hypothesis, means few or preferably no opportunities to secure consistent positive abnormal returns. This means the provision of a board structure which supervises management in such ways as will bring forth information to provide markets with accurate and timely data on the firm's condition. This also means data and other information appropriate to the monitoring of agency costs.

In the Barings example, the corporate governance issues do not conform to the norms of analysis. The forms of contract by which the owners would induce senior management to conform to their goals did not bear upon arrangements. The owners did not exercise voting power as a check on management but had conceded that power to the most senior management. There is no evidence to suggest any significant role for debtholders in relation to risk-return choices adopted by the boards within the Barings Group.

Given this position on voting power, the determination of executive compensation rested with the most senior management. This was based on a simple profit link whereby half of gross profits before tax and minority interests was set aside as a bonus pool. In very profitable years the bonus payment was about three or four times salary for directors and senior management. There was no real check on how this bonus distribution system worked in practice because there was no compensation committee, with independent directors, at board level to review what was being done (Conyon *et al.*, 1995). How effective any such committee could be is questionable, given where voting strengths lay (Hart, 1995, p. 682).

The Barings example holds lessons for a quite different principal-agent problem from the customary one spelt out at the beginning of this section, namely resolution of issues between owners, debt holders and management. Here it has become one about the ways in which the lesser ranks of management and market participan could be induced to act in the interests of senior management, namely to expand th bonus pool. The simple schemes employed were based upon profit measurement assumed to be realized profit. There was no provision to ensure that what was realized was true rather than constructed. In that respect senior management were seemingly unaware of having put in place an incentive structure not subject to comprehensive checks and bonding to realized profits. In the event the bonus pool was an erroneous measure of performance which drained liquidity and potential shareholders' funds from the Group no less certainly than Account 88888.

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[10] Issues in disclosure have been explored recently, especially U.S. requirements, in this journal (Chow *et al.*, 1996, p. 134).

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APPENDIX

GLOSSARY OF TERMS

Advance margin (intraday margin)	Amount of cash or securities required to be deposited with a clearing house during the course of a trading day.

	Typically advance margin is only called during periods of increased volatility when end-of-day variation margin calls are expected to be high and the clearing house wants immediate funds from its members to pre-empt any credit concerns.
Arbitrage	Purchase of a security in one market and the simultaneous sale of the same or an equivalent security in the same or another market for the purpose of profiting from the price differential between the two markets as a result of prevailing conditions in those markets.
Clearing house	An institution which registers, monitors, matches and guarantees trades on a derivatives exchange and which carries out the financial settlement of those transactions.
Clearing member	A member firm of a futures clearing house. Each clearing member must also be a member of the relevant exchange. Clearing members may provide registration and settlement services on behalf of other exchange members who are not themselves clearing members.
Client account (customer account)	An account maintained by a clearing member on behalf of its customers for their trading in securities or derivatives. Regulatory agencies often require strict segregation of client account balances from the house account. Within Barings, transactions for client accounts were also known as agency business. See also house account.
Euroyen	Yen denominated instrument traded outside the formal control of the Japanese monetary authorities.
Exercise price	See Strike price.
Financial futures	Contracts to buy or sell a standard quantity of a specific financial instrument or index (or, in some cases, receive or pay cash based on the performance of an underlying instrument or index) at a predetermined future date and at a price agreed through a transaction on an exchange.
Fungible contracts	Futures or options contracts which are interchangeable between two exchanges. Such contracts have identical specifications and the two exchanges have agreed that such contracts may be settled on either exchange.

Hedge fund	A collective investment fund which takes large, and often leveraged, risk with the aim of producing a high return on capital.
House account	An account maintained by a securities dealer to record transactions undertaken on the dealer's own account for his profit or loss. The house account is used to separate such transactions from those undertaken for clients. See proprietary trading.
Implied volatility	A measure of volatility of the underlying security determined by reference to the market price of options.
Initial margin	The amount of cash or securities to be deposited at a clearing house to establish a futures or options position. Initial margin is established at a level estimated as sufficient to enable a clearing member to meet its obligations should it fail to pay variation margin at the end of the day. See variation margin.
JBG	Japanese Government Bond.
JGB future ten years	A futures contract traded on SIMEX, TSE and LIFFE based on JGBs with ten years to maturity and with a standardized coupon of 6 per cent.
Long position	A long position is held by a net holder or buyer of an instrument. It appreciates in value when the market price increases. Note that a holder of a put option is long the contract but profits when the underlying market declines.
Margin	Cash or securities deposited with an exchange both as a form of collateral and a way of settling realized and unrealized profit and loss on positions. Margin also attempts to ensure that clearing members have sufficient resources to support open positions.
Margin call	A demand from an exchange, or from a broker or dealer carrying a customer's position, for additional cash or collateral in respect of a position.
Mark-to-market	The valuation of a securities portfolio to current market prices.
Matched positions	Equal and offsetting long and short positions.

Nikkei 225	An index based on 225 Japanese stocks traded on the Tokyo Stock Exchange. The most widely followed index in Japan and the basis for the major Japanese equity derivatives contracts.
Nikkei 225 future	A futures contract based on a multiple of times the Nikkei Stock Index traded on OSE and SIMEX. The contract specification is different between the two exchanges.
Nikkei 225 option	An option based on the Nikkei 225 future traded on OSE and SIMEX. The contract specification is different between the two exchanges.
Open outcry	A trading method where trading takes place in a designated physical area of the exchange within an agreed time period. Prices are agreed by traders on the floor of the exchange, after which both traders complete a deal ticket to record the transactions. These tickets are matched by exchange officials, after which the deal is recorded.
Open positions	A position in futures and options, either long or short, not matched by offsetting transactions or satisified by delivery.
Option on financial futures	Options on financial futures take two forms: put or call options. Put options are contracts sold for a price (the premium) that gives the holder the right, but not the obligation, to sell to the writer of the contract, over a pre-defined time period, a specified quantity of futures contracts at a specified price (the strike price). Call options are similar contracts sold for a price that gives the holder the right, but not the obligation, to buy from the writer of the option. By their nature, options give rise to different risk profiles between buyers and sellers. Options buyers are exposed to limited loss, but theoretically unlimited profits. Option writers (sellers) in contrast have limited profit opportunities but potentially unlimited loss.
OSE	Osaka Securities Exchange, a derivatives exchange offering contracts on the Nikkei Stock Indices.
Over-the-counter (OTC)	A security or other instrument that is not traded on an organized exchange. OC instruments can be created with any provisions allowed by law and acceptable to counterparties.

Premium	The price paid for an option contract at the time of its purchase.
Proprietary trading (Principal trading)	Generally used to describe risk positions for an institution's own account as principal and distinct from client business. See house account.
Settlement	The process by which a trade is entered onto the books and records of all the parties to the transaction including brokers or dealers, a clearing house, any other financial institution with a stake in the trade. Also the completion of any required payment between two parties to discharge an obligation.
Short position	A short position is held by a net seller of an instrument. It appreciates in value when the underlying market price declines, for example, selling a future. Note that a seller of a put option benefits from an increase in the price of the underlying market or instrument.
SPAN margining	Standard Portfolio Analysis of Risk. A system of determining margin used by SIMEX, and some other derivative exchanges. SPAN margining uses statistical models to determine the margin required against individual members' positions using simulations of maximum foreseeable adverse movements in price.
Straddle	An option position achieved by combining a put and call option on the same underlying instrument and with the same strike price. Sellers of straddles anticipate that the underlying price will stay close to the level of the strike price of the options they have sold, or that the volatility of the price will be less than implied in the option prices.
Strike price	The price or rate at which an option begins to have a settlement value. The strike price or rate is usually set at the time the option contract originates.
Switching	See Arbitrage. In the case of Barings, this activity typically involved the simultaneous purchase and sale of the same futures contracts on different futures exchanges; SIMEX and OSE being the two in this instance.
Three-month Euroyen contract	A futures contract traded on SIMEX and TIFFE based on the three-month interest rate for Euroyen.

Tick	The minimum unit of price change of a futures contract.
Variation margin	The amount of cash paid or received by the exchange to reflect changes in the unrealized profit on open futures positions.

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MICHAEL BRIERS, PETER LUCKETT AND CHEE CHOW

Data Fixation and the Use of Traditional Versus Activity-Based Costing Systems

An important debate in the contemporary accounting literature relates to the relative merits of activity-based versus volume-based product costing methodologies. Traditional volume-based costing systems are said to be flawed and may seriously mislead strategic decision making. Such arguments assume that decision makers use such information in an unproblematic way. This article reports on an experiment designed to investigate whether decision makers are able to overcome data fixation in a setting involving the use of product cost information. In response to criticisms of previous accounting studies of data fixation, subjects received some feedback after each decision, and were rewarded based on performance. The experiment involved subjects making a series of production output decisions based on detailed case information of a hypothetical firm facing different market conditions for each decision. A between-subjects design was utilized with two cost system treatments: activity-based costing (ABC) and traditional costing (TC). It was hypothesized that the group provided with ABC cost data would make 'optimal' decisions and the group provided with TC cost data would overcome fixation. The results of the experiment indicated that there was, in general, evidence of data fixation among TC subjects, but a small number of subjects did adjust to ABC costs. These results are discussed in the light of previous research and some future directions are outlined.

Key words: Activity-based costing; Data fixation.

An issue that has attracted substantial attention in the accounting literature is the extent to which decision makers become fixated on the output of accounting systems. That is, decision makers display an inability to look behind the labels attached to accounting numbers in order to judge the appropriateness of the information for a given decision. Previous accounting studies have provided evidence that data fixation exists in a number of settings. These studies, however, have been subjected to some criticisms, particularly relating to the failure to provide subjects with

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feedback and rewards which would, respectively, enable and motivate them to overcome data fixation.

The present study investigates the conditions under which decision makers fixate on the output of product cost systems which do not reflect the underlying cost behaviour patterns ('traditional costing') in a production output decision context. In particular, traditional volume-based costing methods have been contrasted with activity-based costing methods which, it is claimed, provide superior information, since they more accurately reflect a firm's underlying resource consumption patterns. Such arguments assume that decision makers are unable or unwilling to 'see through' the rules and procedures used to generate the flawed cost information. There is, however, no systematic evidence in the management accounting research literature to support this claim. This experimental study aims to initiate such an inquiry.

The experiment involved subjects making a series of production output decisions based on detailed case information of an hypothetical firm facing different market conditions for each decision. A between-subjects design was utilized with two cost system treatments; activity-based costing (ABC) and traditional costing (TC). It was hypothesized that the group provided with ABC cost data would make 'optimal' decisions, and subjects provided with TC cost data would overcome fixation, given a realistic task, feedback about performance and a performance-based reward. The results of the experiment, however, indicated that there was, in general, evidence of data fixation among TC subjects, though a small number of subjects did adjust to ABC costs. These results are discussed in the light of previous research and some future directions are outlined.

DATA FIXATION, FEEDBACK AND REWARDS

The issue of functional fixation or data fixation has received a great deal of attention over the last three decades.[1] This research, which originated in the psychology literature (Maier, 1931, 1933; Duncker, 1945), has been applied to accounting issues. In the context of data fixation, it has been interpreted as 'an ability on the part of users to look behind labels attached to accounting numbers, even in cases where the methods used in the calculations of those numbers are fully disclosed' (Bloom *et al.*, 1984). Since fixation on accounting data may result in suboptimal decision making, the investigation of this phenomenon is of importance to accounting researchers.

The existence of data fixation has been reported in a range of decision contexts including the use of FIFO versus LIFO inventory assumptions in various managerial decisions (Dyckman, 1964; Bruns, 1965)[2] and investment decisions (Dopuch and

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[1] Note that the term data fixation has been argued to be a better description of the phenomenon of interest to accounting researchers. In psychology, functional fixation is concerned with the ability of individuals to find alternative uses for the same object. In accounting, the concern is with the ability to change one's decision rule in situations where the accounting outputs are derived using different rules (an exception is Moon, 1990). For further discussion see, for example, Ashton (1976), Moon (1990) and Murray (1991).

[2] While Dyckman (1964) and Bruns (1965) did not specifically address the notion of functional fixation, their work examined issues consistent with fixated behaviour.

Ronen, 1983; Abdel-khalik and Keller, 1979), variable versus full unit costs in product pricing (Ashton, 1976; Swieringa *et al.*, 1979; Dyckman *et al.*, 1982; Marchant, 1990) and project pricing decisions (Barnes and Webb, 1986), alternative standard cost calculations in control decisions (Chang and Birnberg, 1977), and straight-line versus accelerated depreciation in individual (Murray, 1991) and in both individual and group product pricing decisions (Bloom *et al.*, 1984).

While Ijiri *et al.* (1966) were the first to recognize the potential usefulness of adapting the psychologists' notion of 'functional fixation' to the field of accounting, it was Ashton (1976), who developed the now dominant experimental methodology for investigating fixation in the accounting context. This approach involves subjects making a set of decisions (such as pricing decisions) using a number of cues, which include a piece of accounting information (for example, a unit product cost). After processing a number of cases, subjects are asked to process the cases again, but with a change in the accounting method (for example, from full costing to variable costing). Where subjects fail to adjust their decision processes, it is concluded that data fixation exists.

Most subsequent fixation studies in accounting have adopted this experimental 'pricing paradigm' with its emphasis on accounting change (for exceptions, see Haka *et al.*, 1986; Moon, 1990). While there has been some variety in the results reported, the general conclusion is that data fixation is usually present. This conclusion, however, has been questioned by some writers, who are critical of some aspects of the research approach (for example, Libby, 1976; Wilner and Birnberg, 1986).

In particular, Wilner and Birnberg (1986) have noted that most accounting studies of data fixation fail to give the subjects feedback. Feedback can provide information about consequences of prior decisions and can signal that the decision process may need some adjustment. Without feedback, failure to change may be due to an unawareness of a problem, rather than fixated behaviour. The current study redresses this problem by providing subjects with feedback relating to their decision performance. In addition, as changing a decision process requires effort, subjects would be expected to require some motivation to make changes. To provide motivation, this study offered an extrinsic (monetary) reward related to performance. Previous fixation studies have not offered such rewards.

The decision context chosen relates to a contemporary management accounting issue. In particular, much current debate has been concerned with the relative merits of alternative product costing methodologies for product-related strategic decision making. Arguably, one of the most important aspects of this debate has been the call for product costing models which focus on the alignment of cost allocation procedures with underlying resource consumption (cost behaviour) patterns. In criticizing traditional costing, advocates of an alternative, activity-based costing, have argued that the use of simple volume-based cost allocation bases does not reflect the complexities of contemporary production environments (see, for example, Johnson and Kaplan, 1987; Shank and Govindarajan, 1988; Cooper and Kaplan, 1992). In such environments, costs are often caused (driven) by many activities which may be unrelated to production volume. As a result, TC systems can distort product costs which may seriously mislead managers when making product-related decisons. For example, low-volume products often tend to utilize a greater share of non-volume or complexity-related activities, such as setting-up machinery, production scheduling and material handling. The rate of usage of these activities, however, is not reflected by output volume, and such products can be significantly undercosted under a TC system. At the same time, a TC system generally overcosts high-volume products, which in effect are cross-subsidizing the low-volume products.

The existence of data fixation is of great interest in this setting. If there is data fixation, then using TC information can result in suboptimal decision making. Such a finding would give further support to those calling for the redesign of exant product costing systems. Given the complexity of manufacturing processes and the large number of products in any firms, it would not be surprising if decision makers were unable to 'see through' the rules and procedures used by TC systems and adjust costs appropriately.

RESEARCH METHOD

An experiment was designed and conducted to examine the issue raised in the previous section.

Experimental Design

The experimental design consisted of two treatment groups. The traditional cost group was given unit cost information computed using a cost system which used a simple aggregate cost allocation method. In contrast, the activity-based costing group was given unit cost information where unit costs were calculated using allocation methods designed to reflect the underlying cost behaviour of the company's production system. The only other difference between the two groups was the format of the feedback report provided at the end of each decision period (see below). In effect, the ABC group acts as a control group, since using the cost information provided by the cost system should result in 'optimal' decisions.

Experimental Task

The experimental task required subjects to make six sets of production output decisions for two products. Each subject was supplied with some detailed background information about a manufacturing company.[3] The company was described as having recently undergone quite dramatic technological changes. The aim of this signal (or cue) was to alert subjects to a potential problem with the cost data.[4] The production processes were explained and the cost system being used was described. Taken together, these details provided a rich set of cues enabling one to judge the appropriateness of the cost system.

It was critical to the design that product costs be distorted in the TC group. To ensure this, two conditions had to hold. First, there had to be at least two products

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[3] Copies of the experimental materials are contained in the Appendix.

[4] Cooper (1987), a leading advocate of ABC, has stated that where a firm changes its technology, but not the cost system, then this can be symptomatic of an ineffective cost system.

(here, Alpha and Beta). Second, the consumption of at least some of the overhead costs had to be unrelated to the number of units produced. Accordingly, there were two distinct overhead cost pools—energy costs and die change costs. Energy cost consumption per product was better reflected by the number of machine hours required to make a unit of product. Die change costs per unit, however, depended on the batch size for each product. The ABC system allocated these two cost pools appropriately. In contrast, the cost driver under TC was totally volume based, namely, the maximum number of units that could be produced in a period.

As a consequence of the conditions created in the case, Alpha, a high-volume product, was overcosted under TC ($8.62 per unit) relative to ABC ($7.08 per unit). On the other hand, Beta, a low-volume product, was undercosted under TC ($103.62 per unit) relative to ABC ($142.00 per unit). Consequently, different production output decisions would result depending on whether subjects used the TC or ABC unit costs.

The subjects were given a separate demand schedule for each of the two products. In order to avoid overcomplicating the case, subjects were told that the two products were sold in independent markets. In each of six periods, they made production output decisions for each of the two products. Subjects were required to indicate their chosen sales level in units, and also to report the total cost they expected for that sales level. Different schedules were used for each period.

Experimental Procedure

Subjects were processed in a number of sessions, with each session restricted to one of the two treatments. On arrival, subjects were given a set of experimental materials consisting of: an instruction sheet describing the requirements of the experiment, the nature of the task, details of the materials to be used, and the reward system; a document containing background case information, including a sample of the demand schedules; a sheet for rough workings; and the demand schedules plus a form to record the decisions for the first period. The researcher read through the instruction sheet and background material and explained, in their role as manager, the tasks they would have to perform.

Subjects were then given sufficient time to complete the task for the first period. Once a subject had made the two decisions, this was signalled and the researcher (or assistant, in the case of larger groups) collected the response sheet and used this to calculate a profit and loss statement. This statement, which provided the subject with feedback on performance in that period, was returned along with the demand schedules and response sheet for the second period. There were two variations of the feedback sheet, each conforming with the cost system being used (see Appendix). For the TC group, the profit(loss) reported after adjusting for the volume variance would be equal to the profit(loss) of a subject in the ABC group making identical production output decisions. Moreover, for those in the TC group, the reported profit(loss) would differ from what was expected if they used the TC information to make their decisions. It was decided to provide such feedback as it is consistent with the type of accounting performance report that would normally be prepared for a manager. Finally, subjects were also asked to indicate how confident they were about their decisions for periods one, three and six.

The step described above was repeated until the sixth period, when subjects were given a post-test questionnaire to complete. The questionnaire had a dual purpose. It provided: (a) information on a subject's perception of what costing information had been used; and (b) the strategy chosen by the subject when making the pricing decisions and whether this strategy changed.

Subjects

The thirty-nine subjects (eighteen in the ABC condition and twenty-one in the TC condition) participating in this experiment were volunteers enrolled in the third-year management accounting course offered by the School of Accounting at the University of New South Wales. This course was the second of two one-semester units of management accounting required for an accounting major. For this experiment it was important that the subjects had some exposure to costing techniques. Without this background, any failure to adjust in the TC condition could not be unambiguously attributed to data fixation. Accordingly, subjects were chosen who had had significant exposure to both TC and ABC systems, including the evaluation of the relative merits of each of these two systems, as part of their management accounting coursework. It was assumed that all subjects had previously learned how to make optimal price/quantity decisions from work in micro-economics. A manipulation check was performed to test this assumption (see below).

Reward System

A monetary incentive was employed to encourage subjects to participate in the experiment, to take the task seriously, and to perform to the best of their abilities. A performance-based reward system was chosen to motivate subjects to strive for the profit maximizing strategy. In the case of the TC treatment, this would have required subjects to adjust the unit cost information provided by the accounting system. Without such motivation, failure to adjust to ABC information may be attributed to the change not being worth the effort, rather than fixation. The maximum amount that could be earned was $15.20. The average amount earned by the ABC group was $15.10 (*sd* 0.326) and the TC group was $12.76 (*sd* 1.560) and the overall average was $13.84.

ANALYSIS AND DISCUSSION OF RESULTS

Manipulation Checks

Three manipulation checks were carried out. The first check was concerned with identifying the unit cost actually used by subjects to make their decisions. It was possible to derive this measure for each product by dividing the subjects' predicted total cost by the level of sales units chosen. To confirm whether this figure accorded with subjects' perceptions of the unit costs they were using, the post-test questionnaire asked how they had derived the costs used in periods one and six. The results of the comparison indicated that most subjects' perceptions agreed with the derived unit costs.

The second check was concerned with the ability of subjects to make optimal output decisions. The individual decisions of each subject for each period and for both products were analysed. This analysis involved identifying the optimal quantity, given the derived unit cost figure as described above. If a subject chose the quantity either side of the optimal quantity (given the derived cost) it was coded as being an optimal decision. All other decisions were considered suboptimal. It seemed reasonable to allow for some variation from the exact quantity as the task involved a number of calculations. Of the 216 (252) decisions made in the ABC (TC) group, 5 per cent (15 per cent) were classified as suboptimal. Hence it is concluded that, in general, subjects were able to employ a strategy consistent with making optimal production output decisions based on the data they employed.

Finally, manipulation checks were made in order to ensure that subjects could be expected to have a good understanding of alternative cost systems and that abilities did not differ between treatment groups. Student grades in the second management accounting course were used as an indicator of the level of understanding. The mean grade for all experimental subjects, who volunteered to participate, was quite high at 75.0 per cent (Distinction level). This compared favourably with the overall mean of 67.4 per cent for the 381 students in the course. Random assignment of subjects to groups was also successful with no significant difference between the means of the two groups (ABC = 75.6%, TC = 74.4%, $t = 0.40, p = 0.693$). A similar result was found for the subjects' grades in the first management accounting course (ABC = 71.4%, TC = 69.8%, $t = 0.51$, $p = 0.611$). Overall, it seems reasonable to conclude that the subjects had the appropriate level of understanding for the experimental task.

Main Findings

The 'derived unit costs' were used as the dependent variable to test for the existence of data fixation. Recall that these costs were derived from subjects' decision responses. It was decided not to ask subjects directly to report the unit costs they used, as this could influence their decision behaviour. The descriptive statistics for the six decision periods for each product, by treatment group, are reported in Table 1.

A 2×6 repeated measures ANOVA on the derived unit cost figures was conducted for each product. In both cases, there were significant differences between the average unit cost figures used by each group (Alpha: $F_{1,37} = 28.95, p = 0.00$; Beta: $F_{1,37} = 31.54$, $p = 0.00$). However, there was no significant within-subjects effect, indicating that no learning took place over time. In addition, profit performance in terms of the actual cash payments made to each group was compared. A t-test indicated significantly higher payments for the ABC group ($t = 6.71, p = 0.00$).

The above evidence can be construed as being consistent with the existence of data fixation. But it is important to note that the validity of such an inference depends on the assumption that the subjects were in a position to make adjustments to the TC information. Such an assumption is warranted in this experiment for the following reasons. First, as described above, all subjects had, as part of their management accounting studies, extensive training with regard to both recognizing

TABLE 1

MEAN (STANDARD DEVIATION) OF DERIVED UNIT COSTS BY PERIOD

Period	1	2	3	4	5	6	'True' costs
ABC							
Alpha	7.10	7.05	7.08	7.17	7.08	7.08	7.08
	(0.08)	(0.13)	(0.01)	(0.37)	(0.00)	(0.00)	
Beta	142.45	143.31	144.77	139.04	142.00	142.00	142.00
	(1.92)	(5.57)	(11.79)	(12.55)	(0.00)	(0.00)	
TC							
Alpha	8.00	8.12	8.04	7.90	8.06	7.99	7.08
	(0.83)	(0.73)	(0.77)	(0.82)	(0.79)	(0.82)	
Beta	113.09	115.08	112.20	116.67	116.67	116.28	142.00
	(27.94)	(18.64)	(24.33)	(24.17)	(23.86)	(24.43)	

when a cost system does not reflect underlying cost behaviour patterns and, where appropriate, recalculating the product costs in question. Second, the case contained some strong signals which indicated that a TC system was inappropriate, particularly with regard to the mismatch between the product costing methodology and the underlying cost behaviour. Third, there was sufficient information to enable the products to be recosted. Consequently, it seems reasonable to conclude that there was data fixation in the TC group.

Moreover, the results indicate that fixation behaviour persists even though the experimental design has addressed some of the methodological concerns of previous studies raised by Wilner and Birnberg (1986). First, this study provided feedback about performance at the end of each decision period. In the absence of feedback, subjects would not be expected to change their decision behaviour. For the TC group, suboptimal performance was indicated by a lower profit than anticipated and by the presence of underapplied overhead. Second, problems of motivating subjects to work to the best of their abilities were addressed by the provision of a performance-related monetary reward. Third, the experimental task was designed to maximise subjects' ability to convert from TC to ABC costs. Limiting the number of products to two meant that the chances of those receiving TC information being able to calculate ABC unit costs from the case data were maximized. There was sufficient information in the case to do this. Energy costs per unit could be derived from the information given regarding machine hours/unit and energy cost/machine hour, while die change cost per unit could be calculated by dividing the cost per die change by the batch size.

Some caution, however, should be taken with this aggregate finding. Even though the statistical analysis indicated that, on average, there was fixated behaviour in the TC group relative to the ABC group, it is interesting to note that a number of subjects receiving TC information did attempt to adjust the unit costs in the direction consistent with an ABC reporting system. This effect can be seen when examining the decision period means for the TC group, as reported in Table 1. There is evidence of some movement away from the reported unit costs towards the ABC unit costs. In fact, six subjects were highly successful, managing to calculate ABC costs correctly and use them for the six decision periods. A further four subjects used ABC costs in some of the decision periods. Thus, while the overall results were statistically significant, there remains evidence that some individuals were able to overcome fixation on the reported costs. What is interesting is that there is no evidence of subjects adopting an intermediate approach, such as anchoring and adjustment (Tversky and Khaneman, 1974).

Given that a subset of subjects in the TC group did manage to calculate the ABC numbers, a legitimate concern is that the rest of the subjects simply had a very low level of understanding about costing and related matters. If this were the case, then the observed behaviour could be attributed to a lack of costing knowledge rather than fixated behaviour.[5] To check this possibility, the course grades for the ten subjects who adjusted to ABC costs were compared with those who did not. The mean grade for those using ABC all or some of the time was 75.3 per cent and for those not adjusting to ABC at all was 73.6 per cent. A *t*-test showed no significant difference between the two subgroups ($t = 0.42, p = 0.680$). A similar result was found for the subjects' grades in the first management accounting course (non-fixated 72.2 per cent, fixated 67.4, $t = 1.13, p = 0.273$). This analysis further strengthens the arguments presented above that there was fixated behaviour in the TC group.

CONCLUSIONS

Research on the use of ABC systems in organizational contexts to date has to a large extent been anecdotal. Advocates for the use of such product costing methodologies have argued that the use of inappropriate (or flawed) TC systems may seriously mislead managers who rely on them for decision making. Such an argument assumes that managers will use product costing information in an unproblematic way. Our aim has been to examine this assumption more systematically by drawing on the notion of data fixation in an experimental setting which attempts to capture some of the complexity of a practical decision making context. The results of the experiment provide some evidence of data fixation as, on average, the decision making performance of the TC group was lower than that of the ABC group. This result, which has been found in some previous studies, occurred even when subjects had prior training in product costing techniques and their use, were provided with feedback about performance and were offered monetary rewards tied to decision performance. While this represents a significant contribution to the data fixation literature, it also initiates a systematic inquiry into the nature of concerns about the potential for supposedly 'flawed' product cost data to mislead managers. A number of issues and opportunities for future research arise from the present study along these lines.

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[5] We would like to thank an anonymous referee for alerting us to this possible alternative explanation for our results.

The first concerns the role of feedback in overcoming fixation. Feedback was provided in this study in response to Wilner and Birnberg's (1986) concern that, without feedback, subjects will not know if they are using an appropriate decision model. Here, feedback did seem to indicate to those in the TC group that there was a problem. An analysis of the confidence data shows that the level of confidence in production output decisions was significantly lower for those in the TC group.[6] However, the feedback does not seem to have been very useful in helping subjects to develop alternative strategies. Some recent work by Bonner and Walker (1994) suggests that for individuals to improve decision performance they require explanatory feedback which consists of both information about the 'correctness' of the decision and some explanation indicating the reason for the result. The feedback in this study did not provide such explanations, so even though subjects may have perceived a problem, they did not necessarily know how to respond. In light of these comments, future research should consider the effectiveness of other types of feedback such as explanatory feedback in helping people overcome fixation.

Second, appropriate incentive structures need to be considered. The aim of the reward in the present study was to provide an incentive to improve performance. Yet, fixated behaviour still remained. It is possible that the reward was not strong enough to entice some subjects to modify their behaviour. As reported above, the subjects in the TC group, on average, received $12.76 for just over one hour's work. Even though they earned, on average, 16 per cent less than the ABC group, the potential gain from trying to make optimal decisions may have been insufficient to motivate a concerted search for better decisions. Furthermore, subjects did not know what the maximum reward was in total, or by periods. Thus, while a reward was included in this experiment, future studies could consider manipulating the reward system, and ensuring rewards are quite low when performance is suboptimal. Alternatively, the perseverance of data fixation could be examined in a market setting, where the penalties for continued suboptimal behaviour would be more critical, potentially leading to bankruptcy.

Third, the nature of the signal or cue may need further consideration. Chang and Birnberg (1977), for example, suggested that the persistence of fixated behaviour is inversely related to the strength of the cue. While the case description along with regular feedback provided strong signals that the output of the TC system was inappropriate for the decision context, this may not have been enough to overcome fixation. Future research could investigate how the nature, type and number of cues influence data fixity in the current decision context.

Fourth, general problem solving ability may be important. For example, while the overall finding indicated the presence of data fixation, some of the subjects in the TC group did overcome fixation. Bonner and Walker (1994) observe that ability can affect performance where the task is unstructured. The task used in the current study was complex and unstructured, requiring subjects not only to identify anomalies with the cost system, but also to transform accounting numbers and interpret feedback in the form of accounting reports. Thus, differences in general problem-solving ability may be an important factor in overcoming data fixation and therefore warrant further investigation.

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[6] Subjects indicated how confident they felt with their price/quantity decisions at the end of periods one, three and six. An average confidence score was calculated for each subject. The mean score (out of 100) for the ABC group (82) was significantly higher than that of the TC group (62) (t-test, $t = 3.82$, $p = 0.001$).

Finally, social factors can potentially explain the persistence of fixated behaviour with respect to the use of product cost information. One possibility is a legitimacy or authority effect where decision makers have an overriding belief that the officially sanctioned information should be used. In the present study this may be manifest in the demand effects of the experimental design where the involvement of the experimenters, in giving instructions and providing regular feedback, may have legitimated the reported product cost numbers. Future experimental research could usefully examine this effect more systematically. Importantly, however, since this is an essentially social phenomenon, a potentially fruitful opportunity for further research also involves the exploration of the use of product costing systems in their organizational context (Hopwood, 1983). Such research, for example, might shed light on the extent to which managers are persuaded by the legitimacy and authority of formal costing systems in organizational settings (see Preston *et al.*, 1992 and Chua, 1995 for examples of research along these lines).

In conclusion, this study has provided systematic evidence regarding the existence of data fixation in decision making contexts using the output of alternative product methodologies. It also raises a number of important questions related to both the cognitive and the social aspects of this phenomenon for future research.

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APPENDIX

EXPERIMENTAL INSTRUMENT

(Common to all treatments)

Participant's Instruction Sheet

Aim of Experiment

The aim of this experiment is to investigate how people make product quantity/pricing decisions. Consequently, your task is to make a series of quantity/pricing decisions.

Task

You are the manager of ***Replicant Technology*** and, as manager, your task is to make a series of quantity/pricing decisions. The experiment consists of six periods and for each period you will be asked to determine the following for two products:

- Sales level in units
- Price at this level of sales
- Predicted revenue at this level of sales
- Predicted total costs at this level of sales
- Predicted total profit at this level of sales

Materials

In order to complete the task you have been provided with the following:

- ***Background information*** about the company, its products, production process, costing system, and pricing policy.
- ***Demand schedules*** indicating quantity/pricing combinations for each of the two products—there are six sets of schedules, one for each operating period.
- ***Forms*** for you to record your decisions on.
- ***Worksheets*** for any cost analysis you wish to do. The use of these worksheets is entirely optional and if you do not use them you will not be penalized in any way.

Reward System

You will be rewarded on the following basis:

- You will be rewarded based on the actual net profit earned each period. ***Replicant Technology*** is based in the Cook Islands and currently 2,800 Cook Island dollars buys one Australian dollar. You are entitled to 10% of the actual net profits of ***Replicant Technology.***

Worked Example:

- Assume the actual profit achieved by you is **100,000** Cook Island dollars, your reward is calculated as follows:

  10% of 100,000 Cook Island Dollars = **10,000** Cook Island Dollars.
  Australian Dollar equivalent = **10,000 / 2,800**
  = **$A3.58** (Your pay for the period).

Note: 1) Your reward will accumulate for each period.
2) If for any period you make zero or negative profit then your reward will be zero, i.e., **not** negative.

Background Information

Replicant Technology, a wholly owned independent subsidiary of ***Cyborg Corporation,*** is a large manufacturer supplying components to the electronics industry. ***Replicant Technology*** manufactures two products, ***Alpha*** and ***Beta,*** for a wide variety of industrial customers.

In the early 1980s, in response to increasing competition and rising costs, ***Replicant Technology***, undertook an extensive capital improvement program. This program essentially involved replacing its existing manufacturing equipment, that had been in use since the 1930s, with numerically controlled equipment, CAD-CAM techniques, and a streamlined materials handling system. The result has been a highly efficient plant, with marked flexibility in production, a lowering of inventory holdings and an increase in labor productivity.

Production Process

Replicant Technology receives partially completed units of ***Alpha*** and ***Beta*** from an outside supplier. As soon as the partially completed units have been received they are immediately processed. Although ***Alpha*** and ***Beta*** are distinct products, ***Replicant Technology*** processes both on the same numerically controlled machine in batches of a fixed number of units. Very little labor is required in the production process itself. Each batch is shipped immediately upon completion. Hence, no finished goods inventory is maintained.

Die Changes

Dies are metal moulds which enable the machine to shape the product. There are two types of dies; one each for ***Alpha*** and ***Beta.*** These dies are changed each time a new production batch is started. Once a die has been changed it cannot be used again. The dies have a strictly limited life which in turn limits the number of units that can be produced in each batch. Since the die for ***Beta*** wears out faster, the batch size for ***Beta*** is smaller than that of ***Alpha.*** Based on this information, the optimal batch sizes for ***Alpha*** and ***Beta*** have been determined to be 2,500 and 100 units respectively. It is ***Replicant Technology's*** production policy to produce ***Alpha*** and ***Beta*** only in their respective optimal batch sizes.

Cost Information

The cost components are materials and overhead. The latter consists of energy costs, and die change costs.

- **Material costs** are the costs of the partially completed units received from the outside supplier. ***Alpha*** and ***Beta*** have different material costs.
- **Energy costs** are dependent upon the number of machine hours used. A unit of ***Alpha*** requires less machine time than ***Beta.***
- **Total die change costs** are determined by the number of batches processed but the cost of an individual die change is the same for each product type.
- There are no other costs.

(TC treatments only)

Budgeted Data for Current Year

	Alpha	*Beta*
Material Cost/Unit	$5	$100
Batch Size (Units)	2,500	100
Cost Per Die Change	$200	$200
Maximum Capacity (Units)	50,000	2,000
Maximum Capacity (Machine Hours)	50,000	40,000
Machine Hours/Unit	1	20
Energy Cost/Machine Hr	$2	$2

The Cost Accounting System

The cost accounting system traces material costs directly to each product. Overhead costs (energy and die change costs) are accumulated in one overhead account. Overhead costs are allocated to products using a rate calculated by dividing the budgeted total overhead by the maximum expected demand, expressed in units of production.

The following cost analysis has been prepared by the management accounting department.

Product Cost Schedule		
	Alpha	*Beta*
Material Costs/Unit	$5.00	$100.00
Overhead/Unit	$3.62	$3.62
Total Unit Costs	**$8.62**	**$103.62**

Overhead Cost/Unit = Total Overhead/Maximum Expected Demand
$188000/52000
$3.62/unit

(ABC treatments only)

Budgeted Data for Current Year

	Alpha	*Beta*
Material Cost/Unit	$5	$100
Batch Size (Units)	2,500	100
Cost Per Die Change	$200	$200
Maximum Capacity (Units)	50,000	2,000
Maximum Capacity (Machine Hours)	50,000	40,000
Machine Hours/Unit	1	20
Energy Cost/Machine Hr	$2	$2

The Cost Accounting System

The cost accounting system traces material costs directly to each product. Overhead costs are accumulated in two different cost accounts: Energy costs and die change costs. Energy costs are allocated to products on the basis of the number of machine hours that it takes to produce a unit for each product. Die change costs are allocated to products in the following manner. Die change cost per batch is divided by the number of units in a batch to yield a rate per unit for each of the products.

The following cost analysis has been prepared by the management accounting department along with the calculation of the overhead rates.

	Alpha	*Beta*
Material Costs/Unit	$5.00	$100.00
Die Change Cost/Unit	$0.08	$2.00
Energy Cost/Unit	$2.00	$40.00
Total Unit Costs	**$7.08**	**$142.00**

Die Change Cost/Unit.

Alpha: Rate = $200 / 2500 = $0.08/unit.

Beta: Rate = $200 / 100 = $2/unit.

Energy Cost/Unit.

Alpha: Rate = $2 × 1 = $2/unit.

Beta: Rate = $2 × 20 = $40/unit.

(Common to all treatments)

Product Pricing Procedure

Both ***Alpha*** and ***Beta*** are sold in separate and distinct competitive markets responsive to changes in price levels. Experience over the last few years has indicated that a relatively small mark-up on the reported cost for ***Alpha,*** but that the mark-up is relatively high for ***Beta.*** Illustrative demand schedules for ***Alpha*** and ***Beta*** are shown below.

Alpha		
Qty	***Price($)***	***Tot Rev ($)***
2,500	11.40	28,500
5,000	11.17	55,850
7,500	10.94	82,050
10,000	10.71	107,100
12,500	10.48	131,000
15,000	10.25	153,750
17,500	10.02	175,350
20,000	9.79	195,800
22,500	9.56	215,100
25,000	**9.33**	**233,250**
27,500	9.10	250,250
30,000	8.87	266,100
32,500	8.64	280,800
35,000	8.41	294,350
37,500	8.18	306,750
40,000	7.95	318,000
42,500	7.72	328,100
45,000	7.49	337,050
47,500	7.26	344,850
50,000	7.03	351,500

Beta		
Qty	***Price($)***	***Tot Rev ($)***
100	181	18,100
200	177	35,400
300	173	51,900
400	169	67,600
500	165	82,500
600	161	96,600
700	157	109,900
800	153	122,400
900	149	134,100
1,000	145	145,000
1,100	141	155,100
1,200	137	164,400
1,300	133	172,900
1,400	129	180,600
1,500	125	187,500
1,600	121	193,600
1,700	**117**	**198,900**
1,800	113	203,400
1,900	109	207,100
2,000	105	210,000

For example, if you wish to sell 25,000 units of ***Alpha*** at a price of **$9.33** you would expect to receive total revenue of **$233,250.** Similarly, if you wish to sell 1,700 units of ***Beta*** at a price of **$117** you would expect to receive total revenue of **$198,900.** As ***Alpha*** and ***Beta*** are independent products it is possible to combine any level of ***Alpha*** with any level of ***Beta*** as long as both are below their individual maximum expected demand levels (50,000 and 2,000 respectively).

Note: It is also possible to produce **zero units** of either one or both of the products.

(Common to all treatments)
(Sample of demand schedules—different sets for each period)

Period One

Alpha		
Qty	***Price($)***	***Tot Rev ($)***
2,500	10.50	26,250
5,000	10.29	51,450
7,500	10.08	75,600
10,000	9.87	98,700
12,500	9.66	120,750
15,000	9.45	141,750
17,500	9.24	161,700
20,000	9.03	180,600
22,500	8.82	198,450
25,000	8.61	215,250
27,500	8.40	231,000
30,000	8.19	245,700
32,500	7.98	259,350
35,000	7.77	271,950
37,500	7.56	283,500
40,000	7.35	294,000
42,500	7.14	303,450
45,000	6.93	311,850
47,500	6.72	319,200
50,000	6.51	325,500

Beta		
Qty	**Price($)**	**Tot Rev ($)**
100	201	20,100
200	197	39,400
300	193	57,900
400	189	75,600
500	185	92,500
600	181	108,600
700	177	123,900
800	173	138,400
900	169	152,100
1,000	165	165,000
1,100	161	177,100
1,200	157	188,400
1,300	153	198,900
1,400	149	208,600
1,500	145	217,500
1,600	141	225,600
1,700	137	232,900
1,800	133	239,400
1,900	129	245,100
2,000	125	250,000

PLEASE TURN OVER

YOU MAY USE THIS PAGE FOR ROUGH WORKING.

(Common to all treatments)
(Sample of response form—one for each period)

Period One

Sales level and associated price for this period:

	Alpha	***Beta***
Sales level in units		
Price at this level of sales		

At this level of sales, what is _your_ *predicted:*

	Alpha	***Beta***	***Total***
Revenue			
Total Cost			
Total Profit			

How confident do you feel about your choice of price/quantity for ***Alpha*** and ***Beta***? Indicate your confidence with a vertical stroke on the scale below.

None Total

DO NOT READ PAST THIS POINT UNTIL INSTRUCTED TO DO SO.

(TC treatments only—one for each period)

Performance Report for Period 1

The following profit and loss statement indicates the actual economic performance of ***Replicant Technology*** as a result of your last quantity/price decision.

Replicant Technology

Profit and Loss Statement

Revenue			$
Less: COGS			
	Alpha	$	
	Beta	$	$
Gross Margin			$
Overhead Over(Under)applied			$
Actual profit			$

Note:

The item: **Overhead Over(Under)applied** indicates that the actual total overhead cost for the period is less(greater) than the total amount allocated to the products using the overhead rate prepared by the management accounting department (refer background information page 2).

(ABC treatments only—one for each period)

Performance Report for Period 1

The following profit and loss statement indicates the actual economic performance of *Replicant Technology* as a result of your last quantity/price decision.

Replicant Technology

Profit and Loss Statement

Revenue			$
Less: COGS			
	Alpha	$	
	Beta	$	$
Actual Profit			$

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ROGER L. BURRITT AND STEPHEN WELCH

Australian Commonwealth Entities: An Analysis of Their Environmental Disclosures

Environmental disclosures of Australian public-sector entities have received scant attention by researchers. Using descriptive statistics, this paper provides an exploratory analysis of the environmental disclosures of a sample of Commonwealth public-sector entities. Following consideration of approaches to accountability and expected trends in types of environmental disclosures and levels of disclosure in the public sector, the annual reports of sixty Commonwealth entities, over the ten-year period 1984 to 1993, are examined. Based on the sample observations, the following results are found: as expected total environmental disclosures increased over the period; on average, budget entities reported a greater volume of environmental disclosures than non-budget entities; over time there was an increase in internal relative to external disclosures for budget entities; non-budget entities disclosed less internal environmental data than budget entities; the predominant form of environmental disclosure was qualitative rather than physical or financial; and, finally, seven themes were evident in the disclosures identified, the greatest volume being community education and training, and energy-related disclosures. Comment is made on the possible reasons for these observations. Finally, future directions for the work in this area are explored, including consideration of possible new accountability structures based on ecological considerations and measurable environmental outcomes.

Key words: Environmental accounting; Government accounting.

Scant previous examination of environmental disclosures of public sector entities in Australia provides the motivation for this work. Australia is a federation with a Commonwealth (national) government, governments in six states and two territories, and a number of local government areas within each State (Bates, 1995, p. 76). Although each level of government has responsibilities with respect to environmental management and protection, the focus of attention here is on Commonwealth public

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sector entities.[1] The Commonwealth Auditor-General's Report No. 18 indicates that in 1993 there were about 191 Commonwealth public-sector entities providing group annual reports in Australia (ANAO, 1993). Environmental disclosures in the annual reports of sixty of these Australian Commonwealth entities, over the ten-year period 1984 to 1993, form the basis for analysis. The sample is divided into budget and non-budget entities, by using a specific classification provided by a member of the Commonwealth Department of Finance. The classification is based on whether funding is predominantly obtained through the budget appropriation mechanism or through market sources. The non-budget sector includes many commercial organizations and it is of interest to examine whether, with their market orientation, they have a different approach to environmental disclosures.

Commensurate with these two types of control over funding are different accountability mechanisms. Whereas budget entities are directly accountable to parliament through an appropriate minister, the accountability requirements for non-budget entities are scattered through numerous enabling Acts, company memoranda and articles (Commonwealth of Australia, 1994a, p. 23). Each of these Acts provides non-budget entities with a large degree of autonomy from direct government political processes (Guthrie, 1993). In consequence, the budget and non-budget groups have different accountability requirements. It was recognized twenty years ago that these two approaches to accountability would result in different disclosures in annual reports (Commonwealth of Australia, 1976, para. 4.4.15), as administration of the non-budget sector is considered to be independent of the political process, whereas the budget sector is directly linked to the policy desires of the government. Hence our proposition is the expectation that 'A departmental report (budget entity) will necessarily be somewhat different in approach and content from the report of a statutory body (non-budget entity)' (Commonwealth of Australia, 1976, para. 4.3.25).

In the last twenty years, considerable attention has been devoted to the discovery of trends in environmental disclosures of private-sector organizations (see summaries in, for example, Gray *et al.*, 1995; Deegan and Rankin, 1997, forthcoming). In spite of this attention there is no agreed theoretical perspective to drive further systematic inquiries. Gray *et al.*, 1995, review some of the suggested perspectives, but none is necessarily appropriate for the analysis of environmental disclosures in *public-sector* entities. Social and political theories may have the greatest potential because other suggested theories, such as economic theory and decision usefulness, detract from notions of administrative accountability which are important in the public sector. Yet available social and political theories are still seen as overlapping by some (Gray *et al.*, 1995, p. 52), competing by others (Arnold, 1990), or as perpetually 'disputed territory' (Tinker *et al.*, 1991, p. 46). Instead of engaging in the unsettled debate on theory in this work, by exploring the volume, themes and form of environmental disclosures in the annual reports of Commonwealth public-sector entities over a period of time it is possible to commence the task of building up a picture of the importance of some contextual factors that have been associated with environmental disclosures. From this work a later contribution to theory development may emerge.

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[1] A literature search revealed the only exploration of environmental disclosures in Australian public-sector organisations was a comparative study of private and public-sector organizations in the state of New South Wales (Gibson and Guthrie, 1995).

What the differences between budget and non-budget public sector entities means for the trends in environmental disclosures has, hitherto, not been explored, hence the work that is now described.

EXPECTED ENVIRONMENTAL DISCLOSURES OF PUBLIC-SECTOR ENTITIES

There exists an unresolved debate about the merits of providing social and environmental disclosures in annual reports. It cannot automatically be assumed that social and environmental disclosures (SEA), beyond the necessary legal requirements, are desirable *per se*. Philosophical debate over the serviceability of different accountability mechanisms persists. A continuum of different views exists. At one extreme of that continuum are the supporters of left-wing radical change who view SEA disclosures as an instrument of decision domination by a ruling class (Puxty, 1986, 1991; Arrington and Puxty, 1991; Habermas, 1991), or by powerful capitalists (Tinker, 1985, 1988, 1991; Tinker *et al.*, 1991). To these groups SEA disclosures would do nothing but prop up inequitable and alienating societal structures. In the middle ground are supporters of enhancing SEA disclosures within the existing pluralistic institutions of society in order to improve the transparency of actions and their consequences (Parker, 1991; Guthrie and Parker, 1990; Gray *et al.*, 1987, 1988, 1991; Gray, 1992a, 1992b). At the other extreme are supporters of the push for radical democratic change within a pluralistic framework; supporters who seek to remove unjust social practices within democratic societies, and whose theorizing supports the introduction of new social and environmental accountings (Power and Laughlin, 1992; Power, 1992; Habermas, 1990, 1991; Maunders and Burritt, 1991).

Without information about the nature of environmental disclosures, it is not possible to place the Commonwealth public sector within the debate on environmental accountability. There are four main reasons why environmental disclosures of Commonwealth entities might be expected to have increased in recent years.

First, the Commonwealth government has signed and has accepted responsibility for the implementation of a growing number of international environmental treaties. These include the conventions on world heritage, climate change, ozone protection, marine pollution, and hazardous waste. These obligations require the development of a Commonwealth legislative infrastructure to support their implementation through the public and private sectors.

Second, the early 1980s was the watershed for the Commonwealth in taking a lead in guiding states towards enhanced awareness of environmental regulation (Boer, 1992; Commonwealth of Australia/States, 1992; Burritt and Gibson, 1993; Bates, 1995, p. 95).[2] Previously, accepting that, because the Commonwealth has no express powers to deal with the environment under the Australian Constitution, the states were left to introduce and administer environmental laws. 'Sabre rattling' by the states, through High Court challenges to the constitutional power of the Commonwealth to make such decisions about the environment, began in 1983 with *Commonwealth v. Tasmania* (1983 153 CLR 168). Referred to as the 'Franklin Dam' case, it involved an order to stop construction of a dam by a Tasmanian state utility, largely because of the expected impact on a pristine river area. The Commonwealth enacted the *World Heritage Properties Conservation Act* in 1983, to fulfil its responsibilities under an international treaty. The unsuccessful High Court challenges by the states against the Commonwealth government's pro-environmental agenda, combined with growing public concern over ecological crisis, mounting evidence that Australia plays a part in a number of global threats to the environment, and the development and acceptance of a National Strategy for Ecologically Sustainable Development (ESD)[3] in Australia from 1989, gave an imprimatur to the Commonwealth in community education and suasion in environmental affairs.

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[2] Boer discusses some of the conflicts between states and the Commonwealth including the Gordon-below-Franklin dam in Tasmania; Fraser Island sand-mining in Queensland; uranium mining in Kakadu National Park. Friction was such that challenges in the High Court were required to establish the prerogative of the Commonwealth to override decisions made by the states.

Third, because of increased 'public concern about the state of the environment' (Commonwealth of Australia, 1992b, p. 55) the Joint Committee on Public Accounts (JCPA)[4] produced a Report favouring greater environmental disclosure in non-budget entity annual reports.[5] As the JCPA has an influence over Commonwealth government policy, an opinion expressed in 1991 that statutory authorities should include an account of all activities which have a significant impact upon the environment may have increased the number of disclosures in the non-budget sector after that date (Commonwealth of Australia, 1991, p. 41). Looking for future consistency in environmental disclosures in annual reports, the JCPA suggested that non-budget entities should adopt the following measures to meet their social responsibilities: they should state measures taken to comply with their environmental responsibilities; whether "best practice" has been used; the nature of monitoring of activities which have a major environmental impact; and violations of accepted environmental standards and steps taken to rectify the problems (Commonwealth of Australia, 1992b, para. 4.73).

Fourth, in 1989, energy efficiency measures for buildings were introduced by the government, seeking to reduce greenhouse emissions (Commonwealth of Australia, 1992b, p. 55). When combined with JCPA support in 1990/91 for annual reporting

[3] The adoption of ESD principles means, amongst other things, that entities should deal cautiously with environmental risk and irreversibility (the precautionary principle), include the costs of environmental degradation in their decisions (polluter pays principle). (Commonwealth of Australia, 1992a, pp. 8–9)

[4] The JCPA reports to both federal houses of parliament on matters relating to the accounts of Commonwealth entities. A full description of the duties of the Committee can be found in Commonwealth of Australia (1981), p. v.

[5] Paradoxically, the JCPA now approves of the rationalization and streamlining of all public-sector annual reports in order to avoid 'excessive and extraneous' detail. It suggests that it is not necessary to publish information about environmental issues in future, provided the information is available 'on request' to any inquirer, including ministers and the public. (Commonwealth of Australia, 1994b, p. 1)

about specified environmental disclosures by departments, agencies and statutory authorities, there is good reason for expecting an increase in energy-related disclosures from the 1991 reporting year in both sectors. Australian heritage and environmental impacts are other themes likely to be reported. The JCPA notes that the non-budget sector is bound by two Commonwealth laws relating to environmental impact assessment of 'policies, programs and projects' and conservation and preservation of Australian heritage (Commonwealth of Australia, 1992b).[6] As neither of these Acts formally requires any disclosure in an annual report to be made by the entities covered, any related disclosures would be voluntary in nature.

In addition to these general and thematic reasons why environmental disclosures by Commonwealth public sector entities might be expected to increase over time, two other disclosure issues arise. Is there a sector differential resulting from government policy effects which have an internal focus and those with an external focus? Second, is there a differential between the level of financial environmental disclosures of budget and non-budget (financially independent) entities?

The first question is linked to the direction of Commonwealth government policy reform. Some policies, such as the energy efficiency program and Ecologically Sustainable Development Working Groups, appear to have an internal focus on managerial efficiency combined with environmental improvement. Other policies have a focus on nationally significant external issues, such as global warming, biodiversity, world heritage and other treaty areas. Hence, both internally and externally focused policy movements have occurred. Examination of internal and external environmental disclosures is a means of unbundling the effects of policy reform.

Arguably, an expected differential between the level of financial environmental disclosures of budget and non-budget (financially independent) entities will exist. Because of 'public obligations', budget entities are more likely than financially independent non-budget entities to disclose voluntarily information about the social costs of their environmental activities.[7] Commercial entities, in the non-budget group, will be likely to regard financial information as competitively sensitive and will be less willing to disclose. With private entities the debate is over the question of whether they can accept any social and environmental responsibilities, and commensurate reporting duties, in the face of commercial market pressures and fiduciary duties to members (Friedman, 1962; Freeman and Liedtka; 1991, Bowie, 1991). For public-sector entities there is the expectation that public not private costs and benefits are the focus of attention. Having said that, the introduction of corporatization and growth of government business enterprises in the non-budget sector possibly blurs the dividing line between public and commercial drivers of decision making and accountability processes. Also, general purpose financial reporting in the public sector is now based on accrual accounting concepts developed in the commercial sector (Pallot, 1990). McLennon *et al.* (1990, p. 11) suggest this market-based cultural approach to transparency in the public sector may mask the other side of public-sector activities, including protection and conservation of the environment. In 1976 the Royal Commission on Australian Government Administration provided the stimulus for annual reports on departmental activities to be made available to the public (Commonwealth of Australia, 1976).[8] The commission foreshadowed the need to recognize that departments and statutory authorities face different pressures for disclosure, the latter were not meant to be directly answerable to the public through a Minister (Commonwealth of Australia, 1976, para. 4.3.25). It might be expected that there would be a disclosure differential between the budget and non-budget sectors. In the budget sector, departmental annual reports have been required to disclose a far greater degree of detail than non-budget entities (Commonwealth of Australia, 1989, 1994b; Commonwealth of Australia, 1982, p. 2261). Hence, it is of interest to examine whether non-budget public-sector entities, with their greater degree of independence from government, do place a different emphasis on financial environmental disclosures.

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[6] *Environment Protection (Impact of Proposals) Act 1974* and the *Australian Heritage Commission Act 1975.*

[7] Weak evidence in support of this view is provided by Gibson and Guthrie (1995). They found a marginally greater emphasis on financial information disclosures in their sample of the 1994 annual reports of twenty public-sector organizations in New South Wales when compared with a sample of forty private-sector reports.

As entities move towards greater commercial involvement it might be expected that there is a tendency to focus more on commercial performance and less on matters of public interest, such as disclosures about actions which affect the environment and their consequences. One potential problem with the budget/non-budget classification used here is that some budget entities operate commercial business units and, because of their partial focus on profitability, might be expected to make fewer environmental disclosures than budget-sector entities untrammelled by commercial business unit responsibilities. For example, the Department of Administrative Services (DAS) operates an 'Asset Services' commercial business unit which serves as a maintenance and construction contractor for Commonwealth properties. However, although this makes the distinction between budget and non-budget sectors less precise, the possible problems might not be as great as initially thought because, in general, entities receiving a budget appropriation (such as DAS), and their associated commercial business units, are claimed to be subject 'to the same annual reporting requirements, and the same level of parliamentary scrutiny' (Commonwealth of Australia, 1995a, p. 145).

As commercial motives gain in importance and attention given to environmental issues increases, it is expected that managers will have a greater involvement with internal environmental matters and related disclosures. Managers rewarded on the basis of their commercial performance have every incentive to introduce and promote controllable, efficiency-based environmental measures in their entities, such as recycling, energy efficiency, and waste management. These are easier to manage, to quantify, to standardize, and to be specific about, than environmental matters which challenge basic values and assumptions (Jackson, 1987; Stone, 1995, p. 97).

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[8] The principal forms of annual reporting mechanisms are (a) annual reports from heads to ministers for tabling in parliament, (b) portfolio budget measures statements authorised by ministers for use by parliament in consideration of the budget estimates, and (c) portfolio additional estimates statements (Commonwealth of Australia, 1994b, p. 1). This article concentrates upon the first of these mechanisms and does not consider possible conjoint effects flowing from disclosures made in other sources.

These myriad reasons may have a bearing on whether Commonwealth entities recognize environmental disclosures as part of their accountability process, and of the government to encourage such disclosures. Information about environmental disclosures would enable further review of whether these factors have led to improved accountability of Commonwealth entities for their environmental impacts and the effects of government policy in this area.

METHOD OF ANALYSIS

The basis of sample selection was dependent on three criteria:

1. The entity had to have operated for the period 1984–93. Entities that were restructured or whose operations were closed and continued by another entity are also included in the above sample.
2. The entity (or entity group) had to have published annual reports for the full ten year period.
3. The annual reports had to be accessible for the full ten years.

On this basis a ten-year uninterrupted period of annual reports for sixty entities was available to the authors. Because of the above criteria the sample was, to some extent, self-selecting, primarily because of the accessibility requirement. Categorization of the sample of sixty entities into budget/non-budget classes was undertaken with help from the Department of Finance. The data set indicates that there is a bias towards budget entities (forty-three budget to seventeen non-budget), which is representative of the actual proportions of reporting entities in these categories (ANAO, 1993, Table 14).

A ten-year period, 1984–1993, is chosen for the analysis because the aim is to examine longitudinal trends in environmental disclosures. Why the 1984 start? First, as noted above, involvement of the Commonwealth government in High Court actions with the states in 1983 made environmental matters more transparent and one might expect to find an increased emphasis on disclosure in following years. Second, a Financial Management Improvement Program (FMIP), introduced in the Commonwealth public sector in 1984, sought to improve public sector accountability (Guthrie, 1992, p. 18).

Data were manually coded from annual reports located variously at the Menzies Library at the Australian National University, the National Library of Australia and the Commonwealth Department of Finance.

For measurement purposes, a disclosure was defined as 'a passage of writing on an environmental issue, underneath a section heading in an annual report'.[9] Analysis of whether a disclosure was related to an environmental matter was determined as follows: (a) if the disclosure was classified as an environmental disclosure by the entity the authors accepted the classification, and (b) departmental reporting guidelines were used as a second check to determine whether the disclosure was considered to be an environmental disclosure. Although this definition is syntactical in intent, it does raise a possible semantic issue related to the difficulty of obtaining a similar interpretation by an independent coder. It has to be recognized that 'it will not always be feasible to prescribe that two independent coders must attain the same data, if their task is to record semantic contents' (Lindkvist, 1981, p. 60; Wiseman, 1982, p. 55) and, consequently, that a degree of interpretation of whether an environmental disclosure occurred is inevitable.

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[9] There is no uniformity in the definition of 'disclosure' in the literature—from the U.S.A. (e.g., Gamble *et al.,* 1993, p. 38) to Australia (e.g., Guthrie and Mathews, 1985, p. 252) in the absence of mandated items for disclosure there is evidence of subjective evidence choice. Authors often simply use the volume of disclosure in pages, or lines disclosed (Mathews, 1993), but the preference here is to identify the nature of each disclosure.

It was possible to have multiple environmental issues recorded in a single passage, in which case each mention of an environmental issue was considered to be a separate disclosure. This basis of recognition has the potential to hide the size of the disclosure. While size of disclosure does not necessarily reflect importance,[10] and length of disclosure is not representative of its quality (Wiseman, 1982, p. 60), an analysis of the frequency of disclosures and changes in disclosures over the ten-year period is sufficient to reflect the importance of a disclosure (Krippendorff, 1980, p. 40).

Trotman (1979), Wiseman (1982), Guthrie (1982), Guthrie and Mathews (1985), Jaggi and Freedman (1992) and Gamble *et al.* (1995), amongst others, have developed and used indexes to measure the importance of environmental disclosures in the private sector. This approach was not used here as analysis of the 'raw' descriptive statistics provides sufficient information about disclosure differences between classes of different entities. However, classification of disclosures under particular themes, for example as undertaken by Guthrie and Mathews (1985), did provide a means to enable easier interpretation of the data.

The second aspect of content to be examined was the proportion of disclosures relating to internal and external activities. For example, a disclosure by the Department of Defence in 1989–90 about progress with the preparation of a draft environmental impact assessment on the proposed relocation of naval armaments from Sydney to Jervis Bay, was made following production of the EIA under the *Environment Protection (Impact of Proposals) Act 1974*. This was classified as an external environmental disclosure, one in which external parties had an interest in an equitable outcome to the proposal. An example of a disclosure relating to an internal inquiry is provided by the Department of Immigration, Ethnic Affairs and Local Government, 1993. The department voluntarily implemented a national inquiry focusing on energy usage and recycling with the aim of saving costs, thereby improving economic efficiency.

Finally the form of disclosure was considered. Were the disclosures financial, physical or qualitative in nature? Analysis by conventional accountants has tended to place a high weighting on disclosures of monetary consequences. These would be particularly important in the context of disclosures relating to the 'polluter pays' and

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[10] Although a line check was made, in one instance, the same words were disclosed by one authority in two different years using a different font. One year the disclosure took two lines, in the next six lines.

'precautionary investment' principles. However, it is argued by Gray *et al.* (1993, p. 234) that non-financial disclosure is likely to be the more powerful means of discharging environmental accountability because transparency is sufficient to demonstrate whether sustainability is being sought, 'to forestall criticism, avoid legal wrangles, or to minimise the possibility of being caught in either embarrassing ignorance or an apparent state of disregard for the biosphere'. Because of these conflicting ideas, artificial indices of environmental disclosures seem to hide rather than provide information (Dierkes and Preston, 1977). Hence, no differentiation is made here between the relative importance of physical, financial and qualitative disclosures—the purpose being to remove any unnecessary bias towards environmental disclosures of a financial kind.

ANALYSIS OF RESULTS

The purpose of this section is to examine trends, and observed differences between disclosures in the budget and non-budget sample entities. Previous discussion indicates that: the total volume of environmental disclosures is expected to have increased in the period; a greater volume of disclosures is expected for budget rather than non-budget entities; and there is likely to be a higher volume of internal disclosures relative to external disclosures. Finally, it is expected that energy-related, impact, and heritage disclosures would dominate.

Analysis of the data is undertaken in four stages, for budget and non-budget classifications:

1. Total, budget and non-budget environmental disclosures were compared for the period 1984–1993 (see Figure 1);
2. internal and external environmental disclosures were compared for the budget and non-budget sectors (see Figure 2);
3. the proportionate forms of environmental disclosures were examined (see Figure 3); and
4. the relative importance of seven identified themes was assessed—recycling, clean-up, environmental policy, EIA/EIS, energy, research, and education and training (see Table 2).

Figure 1 illustrates the weighted annual average of the number of disclosures[11] for budget and non-budget entities. It confirms an underlying increase in the trend of total disclosures during the period, and that budget entities have a greater level of environmental disclosures than non-budget entities. Until 1988 the volume of disclosures for both groups was at a very low level. However, following an increase in 1991, there is a marked divergence between the groups. A decline in the average level of non-budget disclosures and a continuing increase in average budget disclosures accentuates this divergence. The total volume of environmental disclosures increased rapidly in the 1990s coinciding with: the rise in Commonwealth involvement in the

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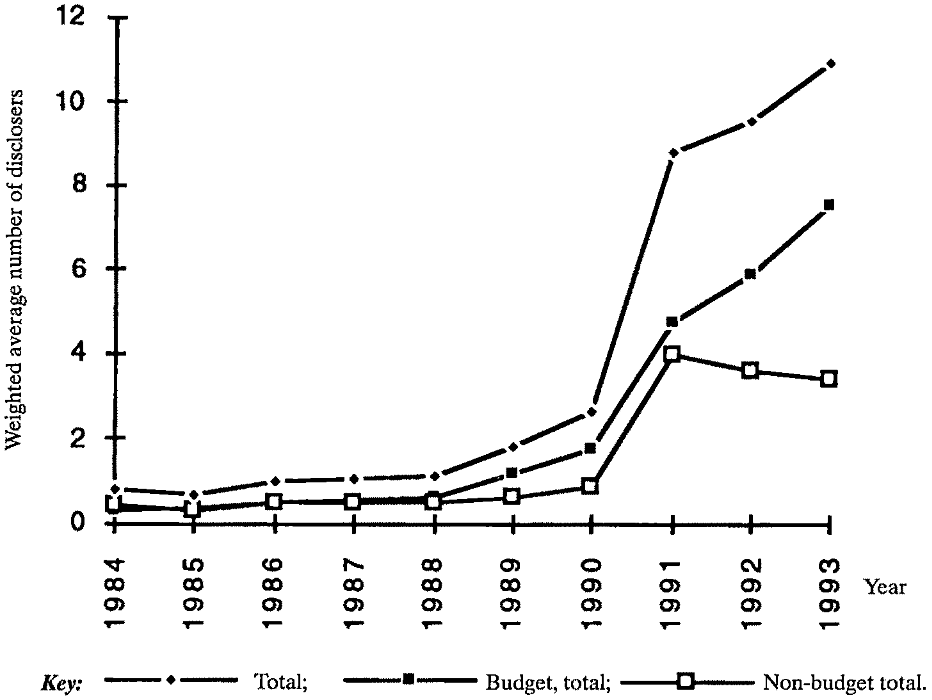
[11] For example, in 1992 there were 258 environmental disclosures made by budget-sector entities. Hence, on average there were six disclosures for each of the forty-three entities.

FIGURE 1

TOTAL BUDGET AND NON-BUDGET ENVIRONMENTAL DISCLOSURES FOR THE PERIOD 1984–93



ESD process, in particular the establishment of the ESD working groups (Commonwealth of Australia, 1992a); development of an Inter-Governmental Agreement on the Environment through a 'political compact' (Commonwealth of Australia/States, 1992; Bates, 1995, p. 97); active involvement of the government and JCPA in promotion of additional environmental disclosures; and the endorsement, by the states and Commonwealth, of a National Strategy for Ecologically Sustainable Development in 1992. The trend is not consistent with a steady rise in disclosures linked to increasing obligations under international treaties established throughout the period; or gradual recognition, through state High Court challenges, that the Commonwealth has an active environmental role to play.

These trends are consistent with the view that budget entities, which need to show they have complied with government policies (including environmental policies) in order to secure the following year's appropriation, are more likely to disclose information about the environmental impacts of their activities than non-budget entities with their independent access to funding.

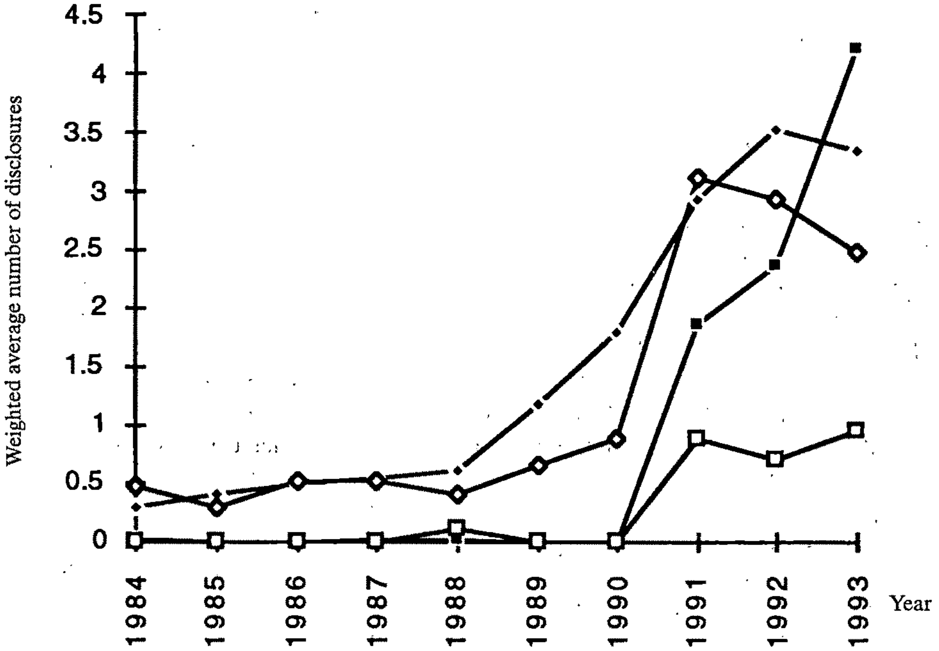
The second issue considered is the level of disclosures relating to internal and external effects of an entity's operations. Figure 2 displays the average annual number of disclosures for both internal and external categories. These results show that, from 1990, non-budget entities do not disclose as much about their internal operations as budget entities, reflecting the different foci of accountability between the two sectors. From 1988, on average, disclosures relating to external operations of budget entities exceed those of non-budget entities.

It is also evident that, until the 1990s, internally motivated environmental disclosures were negligible for all entities. After 1991, internal disclosures of budget entities grew, eventually to overtake the volume of external disclosures in the last year sampled. As noted, perhaps this result follows from an incentive for managers to focus on internal environmental disclosures in response to such reforms as the government energy program.

Similar trends can be observed between disclosures relating to external government environmental policy matters facing non-budget and budget entities. Of interest is the increase in non-budget external disclosures in 1991. This outcome is driven largely by a group of EIAs undertaken by the Federal Airports Corporation and the Pipeline Authority in accordance with the *Environmental Protection (Impact of Proposals) Act 1974.*

FIGURE 2

ANNUAL INTERNAL AND EXTERNAL ENVIRONMENTAL DISCLOSURES



Key: ——■—— Budget, internal; ——□—— Non-budget, internal; ——◆—— Budget, external; ——◇—— Non-budget, external.

Figure 3 displays the forms of disclosure along with the level of each form expressed as a percentage. In all categories budget entities had a higher proportion of disclosure than non-budget. Of the forty-three budget entities selected, eight (19 per cent) made no environmental disclosures at all in the ten-year period, and seven (41 per cent) of the seventeen non-budget entities made no such disclosures. These results are consistent with the proposition that budget entities are more inclined towards environmental disclosure than non-budget entities.

For both budget and non-budget entities there is a low proportion of physical and financial disclosures about the environment. This finding is consistent with other studies in the public and private sectors (see, for example, Robertson, 1977; Guthrie, 1982; Guthrie and Parker, 1990, Gray *et al.*, 1993, p. 207; Gray *et al.*, 1995; Gibson and Guthrie, 1995, p. 119; see also Arnold, 1990, and Mathews, 1993, p. 119) and indicates that there is a greater preference for the disclosure of qualitative information. The low volume of physical and financial disclosures means that there is

FIGURE 3

THE PROPORTIONATE FORMS OF ENVIRONMENTAL DISCLOSURES

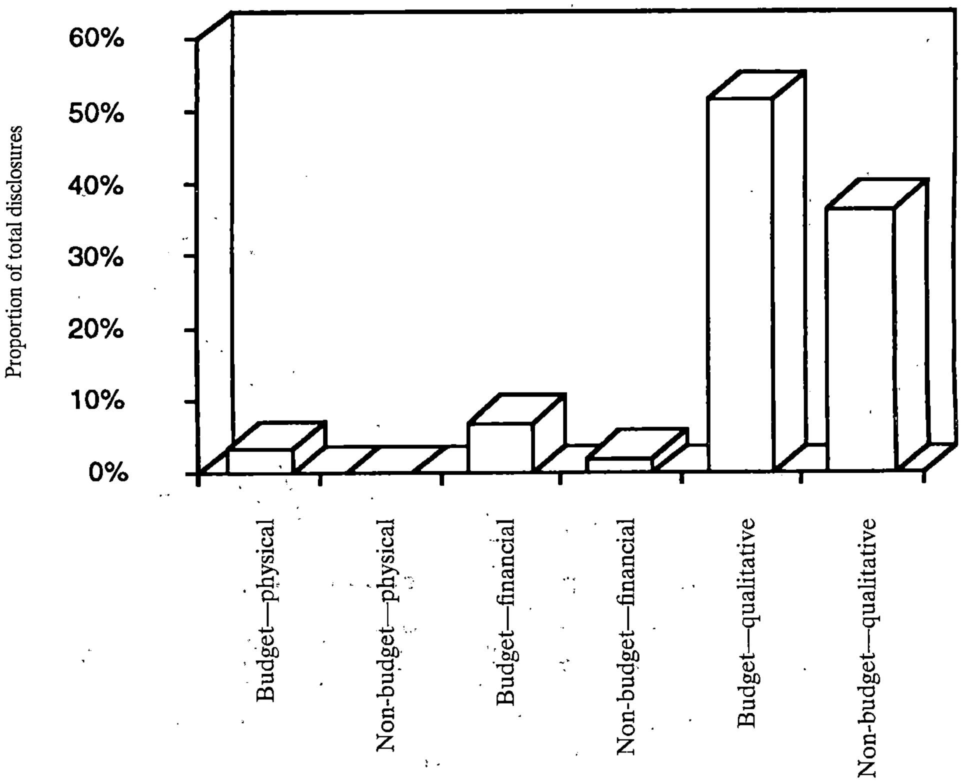


TABLE 1

THEMES OF ENVIRONMENTAL DISCLOSURES

1	*Education and training*—three main information disclosures were considered to fall under this theme: —publication and research reports provided to inform the public; —seminars and lectures in a public arena; and —advice or information provided to a specific individual
2	*Environmental policy*—includes any specific statements about the entity's environmental policy and more general comments about the entity's commitment to environmental issues
3	*Research*—this theme included disclosures about specific environmental research projects, the funding for these projects, and the administrative arrangements involved
4	*Energy program*—the disclosures in this category reflect the requirements of the Department of Primary Industries and Energy program. Disclosures cover the amount and types of energy used and mechanisms used to improve the efficiency of energy usage
5	*EIA/EIS*—Environmental Impact Assessments and Environmental Impact Statements
6	*Recycling*—disclosures relating to the use of recycled products or efforts to recycle waste
7	*Clean-up*—any disclosures pertaining to the remediation of damage to the environment

little information provided by the sample of public-sector entities about quantified environmental benchmarks, standards or targets.

Seven main themes were identified in environmental disclosures: environmental policy; education and training; clean-up; energy program; recycling; EIA/EIS; and research (see Table 1).

Table 2 classifies these themes for both budget and non-budget entities, with trends identified using ratios for the average volume of budget and non-budget disclosures. For example, in 1993 an average of 0.674 disclosures were reported on recycling by each budget entity. The ratio of total disclosures over the period indicates that budget entities reported over twice as many disclosures as non-budget entities.

Inspection of Table 2 shows that for the total environmental disclosures of all entities in the ten-year period, the dominant themes, in order, are education and training, environmental policy, research, and energy efficiency activities. There is a minor variation between the ranking for budget entities—education and training, energy program, environmental policy and research—and for the non-budget sector—education and training, environmental policy, research, and EIA/EIS.

In accordance with expectations about the pressures of commercialization on environmental disclosure, most of the identified themes demonstrate a relatively higher level of disclosures for budget entities. In particular, disclosures about education and training, environmental policy, research, energy program, and recycling are dominated by budget entities. Surprisingly, two themes, clean-up (all periods) and EIA/EIS (except for 1993), have greater average disclosures by non-budget entities, although the volume of disclosures for both themes is low.

Again, somewhat surprisingly, environmental disclosures about community education and training is the dominant theme in both the budget and non-budget sectors. Although education and training disclosures are made consistently throughout the period, a rapid rise occurs for both budget and non-budget groups at the time

Table 2

THEMES OF ENVIRONMENTAL DISCLOSURE: A COMPARISON OF BUDGET AND NON-BUDGET RATIOS

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	Total
1 Education and training											
Budget	0.163	0.256	0.465	0.302	0.698	1.093	1.744	3.442	3.791	2.860	14.814
Non-budget	0.235	0.059	0.176	0.235	0.118	0.529	0.647	3.235	2.706	2.059	10.000
Ratio	0.69	4.39	2.64	1.29	5.92	2.07	2.70	1.06	1.40	1.39	1.48
2 Environmental policy											
Budget	0.070	0.116	0.209	0.140	0.326	0.372	0.535	1.349	1.372	1.070	5.558
Non-budget	0.059	0.000	0.059	0.118	0.059	0.235	0.294	1.471	1.176	0.941	4.412
Ratio	1.19	—	3.58	1.19	5.53	1.58	1.82	0.94	1.17	1.14	1.26
3 Research											
Budget	0.140	0.186	0.116	0.233	0.163	0.349	0.488	0.744	1.116	1.465	5.000
Non-budget	0.118	0.118	0.294	0.176	0.176	0.235	0.412	0.647	1.000	1.118	4.294
Ratio	1.19	1.58	0.39	1.32	0.93	1.49	1.18	1.15	1.12	1.31	1.16
4 Energy program											
Budget	0.000	0.000	0.000	0.023	0.023	0.000	0.000	1.140	1.558	3.326	6.070
Non-budget	0.000	0.000	0.000	0.000	0.118	0.000	0.000	0.412	0.412	0.529	1.471
Ratio	—	—	—	—	0.19	—	—	2.77	3.72	6.29	4.13
5 EIA/EIS											
Budget	0.070	0.070	0.116	0.140	0.070	0.116	0.093	0.279	0.186	0.279	1.419
Non-budget	0.176	0.118	0.118	0.235	0.176	0.118	0.118	0.824	0.412	0.235	2.529
Ratio	0.40	0.59	0.98	0.60	0.40	0.98	0.79	0.39	0.45	1.19	0.56
6 Recycling											
Budget	0.023	0.000	0.000	0.000	0.000	0.000	0.000	0.442	0.605	0.674	1.744
Non-budget	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.235	0.235	0.353	0.824
Ratio	—	—	—	—	—	—	—	1.88	2.57	1.91	2.12
7 Clean-up											
Budget	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.093	0.023	0.023	0.140
Non-budget	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.118	0.059	0.059	0.235
Ratio	—	—	—	—	—	—	—	0.79	0.39	0.39	0.60

of increased government involvement in the development of ESD processes in the early 1990s. While expected for the budget sector, with its parliamentary form of public accountability, the result is a surprise for non-budget entities with their driving focus on commercial interest groups.

Aside from education and training, there is continuity throughout the period in disclosures for both types of entity in respect of: environmental policy, research, and EIA/EIS. In each, 1991 is a point of departure—there is a notable increase in the volume of disclosures. Also, pre-1991, three themes—recycling, clean-up and energy program—have a zero or negligible average volume of disclosures, confirming the motivational effects of the events occurring around 1991.

CONCLUSION

The results of this study indicate:

1. Total environmental disclosures increased over the sample period. This increase parallels Commonwealth support for the ecologically sustainable development process during the 1990s and an arrangement for inter-governmental cooperation on the environment.
2. From 1989 the volume of budget entity environmental disclosures is greater than for non-budget entities. Prior to 1989 the volume for both was uniformly low. This observation accords with the higher level of organizational dependency of the budget sector on the government for future appropriations, and the associated need to *be seen* to implement government policies.
3. Over time, internal relative to external disclosures made by the budget sector increased.
4. Non-budget entities disclose less environmental information about their internal operations than budget entities, suggesting that, while environmental issues have grown in importance, commercial pressures have checked the growth of such disclosures, relative to budget entities.
5. Seven main themes of environmental disclosure are evident, with surprisingly the dominant theme being public education and training in both budget and non-budget entities.

Summing up, environmental disclosure by Commonwealth public-sector entities has increased; is partially motivated by *ad hoc* single issues, but retains some consistent themes over the period studied; provides no standards against which to compare actual environmental performance and, hence, does not provide information in a form which will readily assist with the assessment of comparative environmental performance over time; and finally is concentrated in the budget rather than the non-budget sector reflecting the dampening effect of a commercial orientation on environmental disclosures.

In spite of the limitations of this study in terms of sample selection and method used, if these observations are typical of the Commonwealth public sector as a whole, the results indicate the government and JCPA need to consider ways of improving the quality of environmental accountings by budget and non-budget entities as a basis for removing unjust social practices while, at the same time, improving the transparency of trends in the 'easier to manage' environmental issues.

FUTURE DIRECTIONS

In 1994 a new structure for the financial management and accountability of Commonwealth public sector entities was referred to the JCPA for comment (Commonwealth of Australia, 1995a, p. xvi). Rather than using the traditional budget/non-budget distinction a new classification of the Commonwealth public sector entities was suggested as a basis for accountability. The proposed classification does not distinguish entities by their funding source but by whether they own assets in their own right. Hence, there would be a shift from an income approach to a balance-sheet approach as the basis for classification. Accrual accounting, with its focus on asset management, would provide a supporting mechanism for the change (Commonwealth of Australia, 1995b). The Department of Finance confirms that the new framework means that thirteen entities in our sample, previously classified as budget entities, would be reclassified as Commonwealth Authorities and Companies (CAC) entities, rather than Financial Management and Accountability (FMA) entities even though they are financed by budget appropriation. CAC entities would be those which legally own their assets separate from the Commonwealth, whereas FMA entities would have no such ownership rights and are responsible for public assets (Commonwealth of Australia, 1994a, p. 22). A list of the sample of budget/non-budget entities, with their respective reclassifications as FMA or CAC, is available from the authors on request. However, the necessary changes to legislation have become very uncertain, following dissolution of parliament in January 1996. Future research is needed to examine the possible reasons for differences and similarities expected when the focus changes from accountability linked with the degree of control over cash funding to accountability based on ownership of assets. An initial examination of the data indicates that the pattern of disclosure is very similar for both budget-FMA and non-budget-CAC groups. One major difference is that for the commercially orientated CAC entities, on a weighted average number of disclosures basis, there is a lower level of environmental disclosures for every theme except EIA/EIS, reinforcing the previously observed dampening effect of a commercial orientation on environmental disclosures.

A second extension of the research is needed in the area of ESD. There was no direct evidence that ESD principles were reflected in the environmental disclosures of the sample entities even though the IGAE commits public sector entities to the ESD process. There remains a need for interpretation and implementation of an appropriate accounting for ESD in the public sector; one which will move analysis forward from the inevitable concentration on easy to identify themes reflecting environmental actions and impacts. At this stage the issue of improving the environmental and social accountability of Commonwealth public sector entities has not been adequately addressed.

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LAURENCE VAN LENT

Pressure and Politics in Financial Accounting Regulation: The Case of the Financial Conglomerates in the Netherlands

This article examines the political process of promulgating two controversial laws which pertain to the reporting of Dutch financial conglomerates. Central to the study is the exploration of the lobbying efforts observed during the process, and the interaction between the government, the supervisors of banks and insurance companies, the industry and its associations, and the users and auditors of annual reports of financial conglomerates. Previous studies in accounting-rule development have often ignored influences that do not fall within the formal regulatory procedures. By adopting an inductive research approach, this study explores in some detail the behaviour of participants, including their use of informal lobbying methods. Pluralist theory is used to explain the nature of the political process and the behaviour of interested parties. The findings indicate that the Dutch political process in accounting matters is indeed pluralistic. Although auditors and producers of accounts seem to have greater possibilities to participate, the users of corporate reports are able to voice their opinion effectively. Overall, the users' preferences were acknowledged in the final rules governing the reporting by financial conglomerates.

Key words: Accounting; Conglomerates; Financial; Regulation.

This article reports the findings of an investigation into the financial reporting regulation of financial conglomerates in the Netherlands, which was a fiercely debated issue involving several government agencies and other interest groups during 1990–4. Financial conglomerates are firms that are engaged in banking as well as insurance activities. Among these companies were some of the most powerful firms in the Dutch financial market: Internationale Nederlanden Groep (ING), Rabobank (RABO), ABN-AMRO and Fortis. The controversial accounting question that had to be addressed when promulgating the requirements for financial conglomerate reporting pertained to the consolidation of the bank and insurance activities into a single annual report. An additional question was whether additional information

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concerning the individual activities would have had to be provided if consolidation was going to be allowed.

In this study, a detailed description of an accounting standard setting process in the Netherlands is provided, to illustrate the typical interaction between Dutch government and interested parties. A case study research design is then adopted to incorporate events and lobby efforts that do not fall within the formal procedures of the regulatory process. Extant accounting literature on lobbying has relied heavily on observable comment letters submitted to the standard setter. However, the success of lobbying is likely to depend on the unobservability of the lobbying agents' activities (Sutton, 1984). Hence, analysis of the publicly available comment letters is unlikely to be the most effective lobbying research method (Lindahl, 1987). The Sutton–Lindahl critique on accounting lobbying research suggests that a research design that aims at incorporating all lobbying methods used, and thereby tries to give a full description of the political process, is desired. Walker and Robinson (1993) argued that a case study might buttress the understanding of the influence of interested parties on the regulatory process and might reveal what happens behind the regulatory scenes. The claim for case-study research is further strengthened by Amershi *et al.*'s (1982) observation that lobbying is likely to be a multi-issue, multi-period process, especially for professional lobby organizations such as industry associations or unions. To restrict the investigation to one issue may present methodological problems because the behaviour of certain lobbying agents can only be understood by taking a long-term view and considering multiple issues. A case approach can address these considerations, hence its adoption here. A few recent studies on regulatory processes have adopted a similar strategy: Klumpes (1994), Walker and Robinson (1994a, 1994b), Rahman *et al.* (1994). This is the first English-language article known to the author to have used a case study design to look at regulatory processes in the Netherlands. Data for the study was collected from documents, archival records and interviews with six key participants in the rule development process.[1]

The case-study report narrates in some detail the history of the promulgation of two draft laws that laid down the reporting requirements of financial conglomerates. Throughout the narrative special attention should be paid to the following interested parties: corporate managers, auditors, the Ministry of Justice, parliament, the Council on Annual Reporting, the Dutch Central Bank (*De Nederlandsche Bank*), the users of accounts (especially, the financial press), and the industry associations.[2]

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[1] These key informants were Mr Noordzij (Federation of Dutch Industries, VNO); Mr Vreugdenhil, MP; Ms Wortmann (Ministry of Justice); Mr Badon Ghijben and Mr Kuijper (ING); and Mr Boezer (Dutch Central Bank, DNB). The key informants were suggested by articles on the topic in the financial press. Also, the interviewees were asked to mention other key players in the field.

[2] In the case study, agents will be referred to by the organization they represent. This may avoid confusion caused by unfamiliar names. To be complete in the presentation of the facts, all relevant agents are identified by their names and organizations in this note. The ministers: Mr Aad Kosto and Mr Wim Kok; the Justice Ministry: Ms Sylvia Wortmann; Dutch Central Bank (De Nederlandsche Bank): Mr Boezer; ING financial officer: Mr Badon Ghijben; Moret, Ernst & Young vice-chairman: Dr Bindenga; Moret Ernst & Young's ING assignment partner: Mr Van der Brande; Christian Democrat Party (CDA) spokesman: Mr Thomas Vreugdenhil, MP; Labour Party (PvdA) spokesman: Dr Willem Vermeend MP; large investment firm: ROBECO.

BACKGROUND

Company Legislation

The legislation of annual reporting is vested foremost in company law (more specifically, in the Dutch Civil Code). It should be noted that, consciously, only the most important aspects of annual reporting have been regulated. Firms have considerable flexibility in comprising their annual report, thus allowing them to choose reporting methods and formats that fit their needs best. Company law in the European Community is subject to harmonization, which implies that countries in the EC have to adjust their national rules to comply with the supranational EC directives. For example, the fourth EC directive pertaining to annual reports of companies stipulates requirements for the format disclosure and audit of the annual report. Furthermore, the seventh EC directive is of importance. It stipulates requirements for the consolidated annual report. Dutch company law was adjusted to the requirements of both the fourth and seventh EC directives in the 1980s.

Since all EC countries are subject to these directives, they are all characterized by having annual reporting regulation vested in company law. However, there are some differences in the degree of detail in which reporting practices have been regulated. On one hand, the U.K. and the Netherlands allow considerable freedom. France and Germany, most notably, have adopted far stricter, and more detailed, rules. In comparison, it should be noted that reporting regulation is not vested in company law in the U.S.

The comparability of annual reports is not a governing consideration in the regulation of Dutch financial reporting (Zeff *et al.*, 1992). Indeed, a different criterion, the 'insight requirement', is the guiding principle. Financial statements should furnish the *insight* required to enable the formation of a sound judgment as to the company's financial position and the result of operations, and, to the extent possible, should provide insight into solvency and liquidity. This insight requirement plays an important role in the case of the financial conglomerates, as will be shown.

Tax Laws

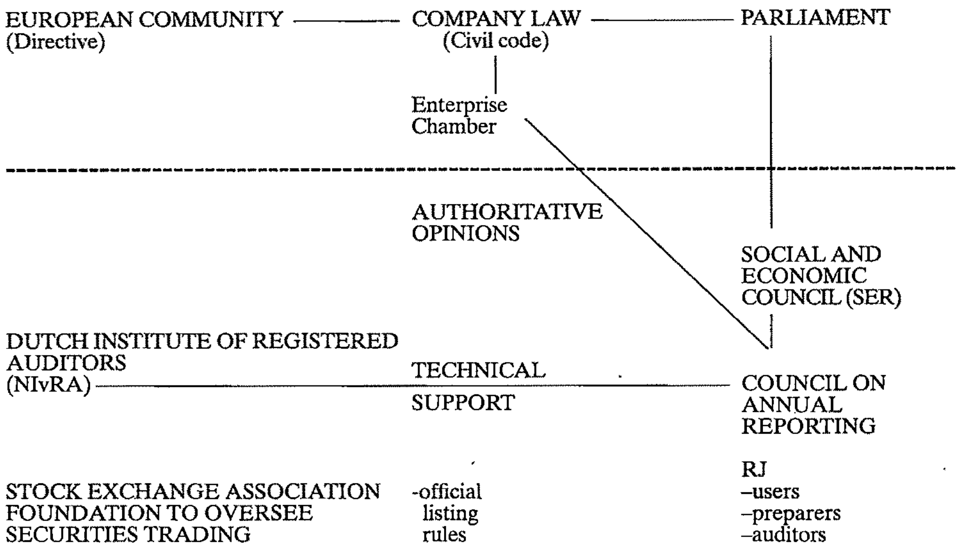
Tax laws are virtually irrelevant for annual reporting in the Netherlands, a feature which is comparable to U.S. and U.K. practice. Many other EC countries, including France and Belgium, have closer ties between the annual reporting regulation and tax reporting, since in these countries the annual report is used to levy corporation taxes.

Judicial Proceedings and Jurisprudence

As a consequence of the lack of detailed prescription in Dutch annual reporting regulation, jurisprudence is an important source of the rules governing annual reporting, as it is in the U.K. and the U.S. The Dutch judicial proceeding is unique owing to its Enterprise Chamber (*Ondernemingskamer*), to which all interested parties may complain if they consider corporate financial statements do not comply with the law (Klaassen, 1980).

FIGURE 1

THE DUTCH REGULATORY FRAMEWORK



Securities Committee

At the time of the research, there was no securities committee overseeing the annual reporting of publicly owned companies. However, the official listing rules of the Stock Exchange Association and the Foundation to Oversee Securities Trading provide these monitoring bodies the opportunity to demand additional accounting information from listed companies. This is notably different from the institutional arrangement in the U.S., where the Securities and Exchange Committee (SEC) is responsible for accounting rule development. In contrast to Dutch rules, the SEC demands separate filing of the required reports.

Representative Organizations

Private-sector regulation with a public-sector framework does occur. The Council on Annual Reporting (*Raad voor de Jaarverslaggeving, RJ*), in which various interest groups are represented, issues guidelines. The Council contains representatives of preparers (employers), users (employees/unions/financial analysts) and auditors. The guidelines of the Council elaborate on the stipulations of the legislative framework. The guidelines themselves do not, however, have the force of law. Efforts to promote compliance with the private-sector guidelines are limited to confidential discussions with the auditors of companies that apparently are departing from the guidelines.

When comparing the Dutch and the Anglo-American systems, a feature to be noted is the relatively weak enforcement status of the guidelines issued by the

Council on Annual Reporting. The Accounting Standards Board in the U.K., for example, has a similar composition and task as the Dutch Council on Annual Reporting. However, the Dutch auditing profession did not commit itself to mention departures from the Council's guidelines in the audit report, while both Australian and British audit reports require remarks about non-compliance with accounting standards. This indicates that the pronouncements of the Council on Annual Reporting are less influential. The U.S. Financial Accounting Standards Board (FASB) also has considerably more power than the Dutch Council. The FASB, a private-sector body of a similar composition to the Dutch Council, derives its influence largely from the SEC which enforces the application of the accounting standards the FASB proclaims. Moreover, U.S. auditors will issue qualified or adverse opinions if a company's annual reports diverge from GAAP.

Regulatory Arrangements Regarding Financial Institutions

Finally, a further point of introduction is provided regarding the institutional and regulatory arrangements that were faced by financial conglomerates. Dutch banks and insurance firms are monitored by the Central Bank and *Verzekeringskamer* (Insurance Chamber), respectively. The Dutch Central Bank, which has considerable power in setting the country's monetary policy, is an independent non-governmental institution. Apart from its tasks in setting the monetary policy, it also is required by law to ensure the stability and 'healthiness' of the Dutch financial system. The Insurance Chamber is a similarly non-governmental monitoring agency, which oversees the insurance industry, and has extensive authority to achieve this. The Dutch Central Bank was committed to a 'general separation' policy in which banks and insurance companies were not allowed to merge. This policy was designed to facilitate sound banking practices and to enhance healthy competition in the industry. However, from 1 January 1990 this general separation was abolished. Subsequently, a wave of takeovers took place in the Dutch financial market. Concurrently, implementation of two EC directives covered the annual reports of banks and insurance companies. Apparently establishment of financial conglomerates was not anticipated when the EC directives were drafted, as there were no references in the directives to the annual reports of these conglomerates. The national legislature now had the opportunity to stipulate reporting requirements for these firms. Financial conglomerates are subjected neither to the legislation of banks nor to the legislation of insurance firms (Explanatory Memorandum, *Memorie van Toelichting*, 22169 A:1). Since there are no special rules in the Civil Code that apply to financial conglomerates, these companies are simply subjected to the fourth and seventh EC directives, and the general requirements of the Dutch Civil Code. One such general requirement of the code deals with the obligation to consolidate the financial statements of all subsidiaries in a group and of all group members (Article 406, para. 1). The exception to this rule, however, is when consolidation violates the *insight* required to enable the formation of a sound judgment as to the company's financial position. Then, consolidation might be prevented, and the annual report of such a group member needs to be disclosed in the notes on the financial statement of the group (separate reporting). Potential violations of this 'insight requirement' are caused by differences in activities between the group member and the group (Article 406, para. 3). In the legal literature pertaining to para. 3 of Article 406, the case of banks and insurance companies is explicitly mentioned as an example in which differences in activities may prevent consolidation (see, Burgert *et al.*, 1990, p. 596; Proceedings, Second Chamber, 19813, no. 3). Two technical accounting questions were raised in the promulgation process of the reporting rules governing financial conglomerates, namely, whether these companies should consolidate both banking and insurance activities. And furthermore, in case consolidation was allowed, whether anything would have to be done about the reduction of information concerning individual activities.

THE CASE: FINANCIAL CONGLOMERATES IN THE NETHERLANDS

The case-study report comprises two distinct parts of the legislative process affecting financial conglomerates—(a) the banking directive and (b) the insurance directive. The first two sections narrate the events of the regulatory process of financial conglomerate reporting. The following section discusses some possible explanations of the case findings based upon pluralist theory. These sections are followed by a brief outline of the findings of pluralist theory. Table 1 sets out a chronology of main events.

The Legislative Process, Part 1: The Incorporation of the Banking Directive

In the background section of this paper, it was stated that Dutch financial reporting regulation encompasses the effects of the fourth and seventh EC directives. Article 1 para. 2 of the fourth directive (PbEG L222, 14 August 1978) stipulates that members of the EC are not compelled to subject banks, other financial institutions, and insurance companies to the requirements of the directive.[3] Despite this option in the EC directive, banks and insurance companies were not excluded from its operating range when both directives were incorporated into Dutch companies law.

On 8 December 1986 the council of the European Community accepted the proposed directive on annual reporting by banks (hereafter, the banking directive; PbEG L372, 31 December 1986). It is interesting to note that the Central Bank was the spokesman for the Dutch delegation at the EC's meetings regarding the banking directive.[4] The Central Bank carried the point that consolidation of bank and insurance activities should not be allowed, which was also the general opinion in the EC (*Memorie van Toelichting*, 22169 A: 1). It should be noted that this issue was barely even a point of discussion at the EC meetings on the banking directive. The Central Bank held that it was appropriate to allow only limited flexibility in reporting practices within a particular industry. Consequently, the Central Bank stressed the comparability argument for reports of firms within an industry. Thus, in the EC discussion the Central Bank agreed with the *communis opinio* that insurance

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[3] The exemption of banks and insurance companies from the fourth directive was temporary. Pending further coordination of these companies, the fourth directive was not necessarily applicable to them.

[4] The reason for this was that financial reporting by banks is a responsibility of the Ministry of Finance. There are close ties between the DNB and the Ministry of Finance.

TABLE 1

MAIN EVENTS

Date	Event
1978	Fourth directive annual reports EC
March 1981	Draft EC bank directive
April 1984	Second draft EC bank directive
1984	Seventh directive annual reports EC: consolidation
1985	Revision draft directive coordination banks
8 December 1986	Approval bank directive by European Council of Ministers
1 January 1990	General separation of banks and insurance companies comes to an end
27 June 1991	Draft law 22169 and Explanatory Memorandum to Second Chamber
19 December 1991	Approval insurance directive by European Council of Ministers
31 January 1992	Publication of joint NVB/VvV advisory paper
25 March 1992	MEY announces its preference for separate reporting by financial conglomerates
2 April 1992	Provisional report 22169 Second Chamber
11 May 1992	Memorandum of Reply 22169 Second Chamber and Memorandum of Alterations 22169
8 July 1992	Final report 22169 Second Chamber
17 July 1992	Memorandum on account of final report 22169 and Second Memorandum of Alterations 22169
July 1992	Justice minister requests advice of Council on Annual Reporting regarding 22169
30 September 1992	Third Memorandum of Alterations
5 November 1992	Draft law 22896 and Explanatory Memorandum to Second Chamber
10 November 1992	Plenary discussion in Second Chamber of 22169
19 November 1992	Draft law 22169 to First Chamber
29 January 1993	Report 22896 Second Chamber
2 February 1993	Provisional report 22169 First Chamber
3 February 1993	Memorandum of Reply 22169 First Chamber
24 February 1993	Memorandum to Report 22896 Second Chamber
April 1993	Conversation between Mr Vreugdenhil and Mr Badon Ghijben (ING)
17 May 1993	Report on written deliberations 22896 Second Chamber
27 May 1993	Publication in Staatsblad 1993-258 of Law 22169
24 June 1993	Amendments Vreugdenhil/Vermeend to 22896
28 June 1993	Second Memorandum of Alterations 22896
1 July 1993	Plenary discussion of 22896 in Second Chamber
12 July 1993	Draft law 22896 and Explanatory Memorandum to First Chamber
31 August 1993	Report 22896 First Chamber
14 September 1993	Plenary discussion 22896 in First Chamber
14 October 1993	Publication in Staatsblad 1993-517 of Law 22896

Source: Kamerstukken and Handelingen (see references), NVB/VvV (1992) and FD (25 March 1992).

and bank activities could not be consolidated. It should be noted that the Central Bank also had not foreseen, at the time of the EC meetings, that financial conglomerates were to become an issue.

Later in the process, after a number of major financial companies had formed into conglomerates and the banking directive was transformed into a draft law by the Dutch Justice Ministry, the Central Bank lifted its objections to the consolidation issue. Pressure rose towards the Central Bank to be more lenient regarding consolidated reporting by financial conglomerates. As a supervisory agent, the Central Bank had more important issues to consider than reporting requirements. To disturb the delicate relationship between the Central Bank and the Dutch financial institutions over this minor point seemed futile (interview with Ms Wortmann). Also, there was some understanding within the Central Bank that the new financial institutions would like to show their over-all financial strength. However, since the financial conglomerates were likely to have an important impact on the public, they would have to disclose sufficient information, including separate reports on both the banking and insurance segments. In addition to the Central Bank's wish for separate reporting, there was another point that should be taken into consideration. The Central Bank strives for congruity between the annual reports of banks and the *maandstaten*, monthly reports, which banks have to submit to the Central Bank. This congruity implies that financial institutions incur fewer costs in complying with reporting requirements (interview with Mr Boezer).[5] One could also contend that the Central Bank had an interest in controlling the knowledge gap between the general public as a user of annual reports and itself, for it has additional information from the monthly reports. Should this gap become too wide, the general public could point to the Central Bank in the case of a bank failure, accusing it of inadequate supervision and of failure to inform the public in time. However, if the gap is narrow, such accusations will have less effect. Consequently, the Central Bank favoured adequate disclosure by financial institutions.

Thus, although the Central Bank relented on the consolidation issue, it maintained its position that additional separate information would have to be provided. Moreover, the Central Bank advised against laying down any further requirements in law until the EC had formulated its own requirements. The Justice Ministry did not consider this advice to be in the interest of financial conglomerates, since such EC requirements would probably take a great deal of time to formulate and the outcome of the EC regulatory processes is not readily predictable (interview with Ms Wortmann). Therefore, it strived to have the whole matter prescribed in law, before the EC formulated its own requirements.

The opinions and actions of the Central Bank are important, not only because it supervises financial conglomerates and has substantial power in the Dutch financial market, but also because, in the initial draft law, it was given substantial authority in setting reporting requirements for banks. The Second Chamber,[6] however, opposed the delegation of rule-making power to a 'private' institution such as the Central Bank. This was a surprise to the Central Bank, since it was not informed by the Justice Ministry of the pending rejection by the Chamber of the proposed draft (interview with Mr Boezer). It is likely that this experience influenced the further involvement of the Central Bank on this issue. In particular, it should be considered that the spokesman of the then largest political party (Christian Democrats [CDA]) in the Second Chamber had received inside information from the banking industry stating they objected to a more pronounced role for the Central Bank in the standard setting process (interview with Mr Vreugdenhil). According to the Central Bank, reporting requirements were issued in order to comply with an explicit request made by the banks. This reveals a conflict between the official statements of banks regarding the Central Bank's standard setting efforts and their 'hidden agenda'. As the Christian Democrats' spokesman pointed out, part of this conflict can be explained by the power the Central Bank embodies in the Dutch financial system. The banks may have feared that their position *vis a vis* the Central Bank would deteriorate by increasing the Central Bank's tasks further.

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[5] Mr Boezer did not agree with Ms Wortmann's opinion that the DNB made a trade-off on the issues of reporting and supervisory tasks. He made the point that the DNB deals with these issues separately with financial institutions.

[6] Parliament consists of two chambers, of which the Second Chamber is the politically more important.

The banking directive should have been incorporated into national law on 31 December 1990. However, the rewriting of the directive into a draft law took until June 1991 owing, in the explanation of the ministers of Justice and Finance, to the complexity of the matter and the *intensive deliberations* with the parties involved (Explanatory Memorandum, 22169, no. 3, p. 3).[7] According to the Justice Ministry, it is policy to encourage involvement by the companies which a draft law will affect if the proposed legislation deals with highly complex and technical matters such as financial reporting. Indeed, the ministry took the initiative to contact *inter alia* AMEV, one of the constituting companies of Fortis, to discuss reporting by financial conglomerates. In their Explanatory Memorandum, the ministers stated that further study was necessary with regard to the consolidation of banks and insurance companies which are members of the same group. This is because it was not foreseen on completing the banking directive that banks and insurance companies would be able to form financial conglomerates. Therefore, it had not been foreseen that consolidation of both activities would become an issue. No rules were laid down pertaining to organizations with equally important banking and insurance activities. The ministers also planned to take the forthcoming insurance directive into account when formulating, at a later stage, their views on the consolidation of activities within a financial conglomerate.

Despite these qualifications, the ministers voiced some preliminary opinions which were also part of the Explanatory Memorandum. The ministers argued that consolidation should not be too readily judged as conflicting with the insight requirement. In their opinion, the only rules which applied to the financial conglomerates with equal shares of banking and insurance activities were those formulated in the fourth and seventh EC directives. The ministers announced that a workgroup had been formed, consisting of industry members, which was to offer advice on the reporting requirements of financial conglomerates.

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[7] When a minister submits a draft law to parliament, he adds an Explanatory Memorandum which contains the history of the draft, the advice offered by representative organizations and an explanation of the purpose and content of the law. The number after 'Explanatory Memorandum' refers to the number of the draft law involved, in this case, 22169. The following number, preceded by the abbreviation 'no.' refers to the number of the document pertaining to a draft law, in this case, document 3 which is the Explanatory Memorandum.

At the same time, the Council of the European Community accepted the directive on (consolidated) annual reporting by insurance companies (hereafter, the insurance directive) on 19 December 1991 (PbEG L374, 31 December 1991). During the formulation of this insurance directive, the insurance industry maintained intensive contacts with the Dutch Justice Ministry. These contacts were used later by the Ministry to discuss the reporting requirements of financial conglomerates with industry members. In particular, the contacts with Nationale Nederlanden, one of the constituting companies of ING, proved important when the Ministry formulated its opinion on the reporting issue (interview with Mr Badon Gijben and Mr Kuijper).

On 31 January 1992, the joint workgroup of industry members, representing both the *Nederlandse Vereniging van Banken* (Dutch Association of Banks [NVB] and the *Verbond van verzekeraars* (Alliance of Insurance Companies [VvV]) presented its advisory paper, *Verslaggeving financiele concerns* (Financial Conglomerate Reporting). Two items were of importance to the current study, namely the proposals on consolidation and segmentation. First, the principal argument of the NVB/VvV workgroup was that financial conglomerates had to and wished to present themselves as single units (NVB/VvV, 1992, p. 2). It was, therefore, not desirable to require separate reporting by the subsidiaries. The wish to be seen as one indivisible unit was also taken emphatically by ING mainly for strategic reasons. In the NVB/VvV proposal on segment reporting, the workgroup stated that more detail should be provided in the notes to the consolidated balance sheet and profit and loss statement to satisfy the insight requirement and also to comply with the requirements of the banking and insurance directives. Insight into segment (activity) would have to be given by splitting the consolidated data up to the level of earnings before taxes. However, there should be no division of shareholder equity between the segments. Such a division was argued not to be in agreement with the *bedrijfseconomische* (business economic) characteristics of consolidated reporting. In the opinion of ING, these business economic problems arise because group equity is the only important figure for shareholders of the group. Shareholders should not be concerned with the allocation of equity over the activities. Re-allocation of shareholder equity between the banking or insurance part of the company does not necessarily have to have special consequences, since this was said to be a fairly arbitrary matter. Importantly, it was recognised that clients of a particular bank or insurance company within the group should refer to the annual reports of that bank or insurance company to be assured of its solvency. Moreover, in the segmentation of group equity, units which are legally part of the insurance company could be allocated to the bank activities because of their specific character. However, this does not imply that the liabilities of these units are guaranteed by the equity of the bank (interview with Mr Badon Ghijben and Mr Kuijper). This statement by ING requires some qualification. By the time of the publication of the ING 1991 annual report, it was not clear whether separate reports would be issued by the NMB-

Postbank or other subsidiaries of ING. Indeed, spokesmen at ING at the time of publication contradicted each other on this matter (FD, 2 May 1992). Consequently, ING's comment on the business-economic argument is not valid, as this argument was used in 1991, at which time ING did not know whether it was going to publish separate reports on the subsidiaries.

The workgroup presented a model for financial conglomerate reporting. This model was new. The discussion of the reaction of the companies involved will analyse which companies reflected this model in their annual report. It is important to note that the Justice Ministry initiated and stimulated the joint NVB/VvV advisory activities, and agreed with its general terms. During the writing process, there was contact between the Justice Ministry and the workgroup. However, within the Justice Ministry it was felt that there was some disagreement between the members of the workgroup on the segmentation issue, in particular between Fortis and ING. Therefore, the Justice Ministry began to formulate some stipulations regarding this segmentation issue before the paper was published. It was in the interest of the Ministry of Justice and the industry to have a shared line of conduct in financial reporting. If controversies on the reporting issue led to completely incomparable annual reports, the EC would have more reason to speed up its regulatory process and impose a standard. Moreover, a shared line of conduct would make a favourable outcome of parliamentary deliberations more likely.

Parliament, that is, the Second Chamber waited until the publication of the industry advisory paper before starting its 'preparatory investigation' of the draft law in a legislative committee in the first quarter of 1992. In their Provisional Report, the members of the Christian Democratic Party stated that they were somewhat disappointed by the industry advice, which they considered a compromise. The Christian Democrats implied that there surely must have been significant controversy on this issue between the members of the workgroup. Log-rolling—that is, the agent who feels the strongest on an issue will be supported by other agents (with marginal interests) on the condition that such a support be reciprocated in due time—had probably taken place, leading to ING's opinion being given priority on this issue. Consequently, the advice was not considered very important by the Christian Democrats (interview with Mr Vreugdenhil). In the Christian Democrats' opinion, one of the driving forces behind the banking directive was the comparability concept. Leaving out the segmentation of group equity as irrelevant was typical of the lack of comparability between financial conglomerates, banks and insurance companies that would result from implementing this advice. The Christian Democrats demand was that separate consolidated annual reports of both the banking and insurance groups would be provided in addition to the over-all annual report of the conglomerate (Provisional Report, 22169, no. 4, pp. 1–2). Notable was the Christian Democrats' stress on the comparability argument, which conflicts with the leading principle of Dutch financial reporting regulation, 'insight'. However, the Christian Democrats seemed to attach a great deal of value to the interests of investors, which would allegedly be served by comparability. Indeed, a large investment firm called the Christian Democrats' attention to the need for the comparability of annual reports.

Although their spokesman on the issue visited several financial conglomerates,[8] it was the investor's interests which appear to have had the most influence.

At this stage of the regulatory process, only the Christian Democrats made remarks regarding financial conglomerates. The ministers answered the legislative committee in a Memorandum of Reply (22169, no. 5, pp. 2–3). They again expressed their opinion that financial conglomerate reporting was not subject to the rules pertaining to banks or insurance companies. In the present situation, without the example of existing rules abroad or in the Netherlands, the initiative of the NVB/VvV should be appreciated as a first attempt to map out the problems and furnish some solutions. With regard to the irrelevance of the segmentation of equity, the ministers stated that the existence of financial conglomerates was a relatively new development. The special characteristics of financial conglomerates, that is, the entanglement of both banking and insurance activities, would have to be expressed in their annual report. In particular, the consolidated annual report of the whole economic entity, the financial conglomerate, was viewed as the vital element. In view of the special properties of banks and insurance companies and their prominent position in society, provision of consolidated information by financial conglomerates will not suffice. Owing to the separation of banks and insurance firms in the past it is possible, at present, to provide information about the separate activities. The question, according to the ministers, is in which fashion the additional information should be offered and which level of insight is sufficient. The ministers suggested that insight should be offered into both activities in accordance with the two directives. This proposal was formalized in a Memorandum of Alterations (*Nota van wijziging*, 22169, no. 6, p. 1) pertaining to Article 406, to which three new paragraphs were added of which paras 4 and 5 are relevant to the issue at hand. The ministers argued that their proposal was in line with the NVB/VvV advice. It should be noted that the Minister of Justice initially did not intend to set down these requirements in law. The initial plan was to let the NVB/VvV suggestions be the (informal) standard, without any legislative backing. However, the new paragraphs of Article 406 were implemented owing to political pressures (Christian Democrats) and the explicit wish of the Central Bank for legislative requirements on this issue (interview with Ms Wortmann and Mr Boezer).[9] In hindsight, both the Ministry of Justice and ING, as a major contributor to the NVB/VvV advisory paper, concluded that the advice was of little relevance to the resulting regulation, in contrast to *ex-ante* expectations. One of the most important statements in their Memorandum of Reply was that the ministers did not wish to commit themselves to *the method* by which insight in both activities would be provided. They insisted that there would be an ongoing entanglement of both activities. The requirement of separate consolidated annual reports could lead, in time, to statements which did not offer a reliable picture of the financial situation per segment, owing to the large number of arbitrary allocations and the dissection of

[8] Vreugdenhil visited ABN-AMRO, ING, RABO, and Credit Lyonnaise Bank Nederland.

[9] The DNB did not only favour legal reporting requirements, it also preferred limiting the reporting options. Limiting freedom in reporting would facilitate comparability, one of the prime goals of the DNB.

what is, in fact, an indivisible economic entity. However, if financial conglomerates felt that the insight demanded was best provided by separate annual reports, they would be permitted to issue such reports.

In summary, the increasing impossibility of distinguishing between banking and insurance products and activities had led the ministers to propose that insight, as a general and broad requirement, should be provided into the entity as well as both separate activities. Managerial discretion would determine the most adequate accounting method of offering such insight. This ministerial proposal was in line with the joint-industry advice. At this stage of the policy process, there was consensus concerning the consolidation of banking and insurance activities into one annual report. Differences of opinion between the ministers and industry on the one hand, and the Christian Democrats and Central Bank on the other, existed on the segmentation issue, and more specifically on the subject of the accounting format by which insight into the discerned activities should be offered.

The final report of the legislative committee emphasized this difference of opinion. The Christian Democrats' reaction to the ministers' Memorandum of Reply was that, although the entanglement of banking and insurance activities might theoretically prevent the adequate separation of both activities in separate reports, in practice, the management of financial conglomerates would still want to know whether a certain activity is profitable or efficient. In other words, it was unlikely that the separation of both activities would prove to be impossible, owing to the need for managerial control within the company. The Christian Democrats also mentioned the position of the supervising institutions: the Central Bank and the Insurance Chamber. The supervisors would also require segmented equity information. The Christian Democrats argued that the ministers' noncommittal position to the accounting method in which insight in both activities should be provided, conflicted with the EC directive and with the proposed changes of Article 406 which, from this perspective, implied that disclosure of the equity of the banking segment was necessary. Interestingly, the Christian Democrats referred to the Fortis annual report as an example of the possibility of disclosing the banking segment's equity. The Fortis report convinced the Christian Democrats that it was possible to provide insight into both activities separately (interview with Mr Vreugdenhil). ING likewise contended that there were only a few technical obstacles to separate reporting (interview with Mr Badon Ghijben and Mr Kuijper). Thus, although the ministers stressed the accounting problems involved with separate reporting, the companies involved readily admitted that these problems were not the major issue.

The ministers subsequently responded to the final report in a Memorandum (*Nota naar aanleiding van het Eindverslag*, 22169, no. 8). They stated that, in their opinion, it was not possible to act in conflict with the EC directives since neither the banking nor the insurance directive made any provisions regarding financial conglomerates. The ministers argued, furthermore, that although it was uncertain whether banking and insurance activities would become so entwined that reporting on separate activities would become arbitrary, both management and supervising institutions would have sufficient instruments for obtaining the necessary insight into the financial condition.[10] Moreover, the ministers agreed with the Christian Democrats' view that a result of Article 406, paras 4 and 5, would be that the equity of both banking and insurance activities would have to be disclosed in some fashion in the segmentation. Furthermore, the ministers announced that the Council on Annual Reporting was going to be consulted regarding the way in which insight should be provided (i.e., the concrete elaboration of paras 4 and 5 of Article 406).[11] This request for advice was a diversionary manoeuvre, the intention of which was to get the proposed Article 406 implemented without further changes (interview with Ms Wortmann). It should be noted that Article 406 retained considerable reporting flexibility to the financial conglomerates. Indeed, it was formulated in such a way that it suited both ING and Fortis, the parties which had the most divergent opinions.

This reply by the ministers formed the somewhat sudden (provisional) end to the problem. The proposed Article 406 was enacted without further changes and the matter was no longer a point of discussion on the floor of the Second Chamber (Proceedings, *Handelingen*, TK 20-1481). The First Chamber likewise had no comments on the issue of financial conglomerates.

The Legislative Process, Part 2: The Incorporation of the Insurance Directive

This was not the end of the story. On 19 December 1991, the Council of the European Community accepted the proposed directive regarding the (consolidated) annual reports of insurance companies (PbEG L374, 31 December 1991). The draft law to incorporate the directive into the Dutch Civil Code was submitted to parliament on 5 November 1992. In the Explanatory Memorandum (22896, no. 3, p. 23) the ministers stated that financial conglomerates should report in accordance with paras 4 and 5 of Article 406. In its report (Report, 22896, no. 5, p. 1), the Christian Democrats at the legislative committee once again stressed the comparability issue. Moreover, the Christian Democrats favoured an organizational structure for financial conglomerates with a top holding and two subholdings which supervised the banking and insurance activities, respectively. All three holdings should disclose a consolidated annual report, and in this fashion the financial position of the whole conglomerate, as well as its constituent parts, would become visible. The Christian Democrats indicated that they were willing to lay down such a structure in law. The idea behind this proposal was that this type of organizational structure would enhance investors' ability to form sound judgements on corporate financial affairs. Moreover, the supervising institutions would be provided with a clear distinction between banks and insurance companies (interview with Mr Vreugdenhil). The Labour Party (PydA) (Report, 22896, no. 5, p. 2) joined the

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[10] The Justice Ministry itself regarded the entanglement argument as weak. Nonetheless, it was considered convenient in parliamentary discussions.

[11] The Council on Annual Reporting subsequently established a workgroup, whose members were Mr J. van der Plas (Moret, Ernst & Young, auditor of ING), Mr J. Buitendijk (ING), A. F. M. van Klaren (CNV/FNV—union), Mr O. L. A. M. Spaan (ABN/AMRO), Mr M. H. Th. Steunebrink (NIvRA—auditor), Professor F. van der Wel (Touche Ross Nederland/academic) (RJ, 1993:4).

Christian Democrats in their opinion that insight into financial conglomerates should be enlarged by setting requirements on the disclosure of banking and insurance activities.

The minister replied (Memorandum to Report, 22896, no. 6, p. 2) that, in accordance with Article 406, financial conglomerates would already have to disclose in their notes on the consolidated annual report, *behoorlijk wat*, that is, substantial information pertaining to the separate activities. These stipulations had been incorporated into the law because it was feared that, without such requirements, a top holding company could disclose just one consolidated annual report without providing any insight into the separate activities.

Apparently, the committee's Christian Democrat members were not satisfied with this solution. They did not consider the disclosure of substantial amount of data in the notes on the consolidation of the top-holding to be sufficient. They once again proposed two additional consolidated annual reports, one for each activity (*Verslag van een schriftelijk overleg*, Report on written deliberations, 22896, no. 8, p. 2). In his reply, the minister maintained that although Article 406 allowed consolidation, separate information about bank and insurance activities was required, in accordance with the EC directives regarding both activities. This answer was still not satisfactory to the Labour and Christian Democrat Parties, and the MPs Mr Vreugdenhil (CDA) and Mr Vermeend (PvdA) submitted an amendment to Article 406 in which the separate reporting on banking and insurance activities was specified. Formally, a new para. 6 was added to Article 406, which demanded the separation of balance sheet information, *in accordance with the format requirements* of the EC directives. The separation would have to include the equity of the separate bank and insurance activities. Through this amendment, the indecision of the ministers regarding the accounting method in which insight should be given was put aside. Instead of the relative flexibility in accounting method choice that the ministers (and industry) advocated, the framework and requirements of both EC directives were imposed. The draft law was subsequently accepted by parliament. The First Chamber did not comment on the proposal. One question that remains to be answered is: what triggered Mr Vreugdenhil and Mr Vermeend's amendment in which the choice of format was specified based on insight, including the requirement pertaining to the segmentation of shareholder equity. Two factors seem to have been influential. A high ranking financial officer at ING voiced the opinion in a conversation with the Christian Democrats' spokesman that Article 406 did not compel financial conglomerates to report separately on banking and insurance activities in accordance with the format requirements of the EC directive, nor did it compel these companies to segment shareholder equity. In fact, the 1992 ING annual report did not disclose segmental information about shareholder equity. Second, the minister announced in the parliamentary treatment of the bank draft that he would consult the Council on Annual Reporting on the matter of the application of Article 406 in the case of annual reporting by financial conglomerates. A source from within the Council confided to the Christian Democrats' spokesman that the Council was unable to reach an agreement. The Council's workgroup advised against the disclosure of segmentation information on shareholder equity, in line with ING's position (interview with Mr Badon Ghijben and Mr Kuijper). The advice of the Council's workgroup met with resistance within the Council. In particular, the auditors' and users' delegation objected to the implications of the advice. They were in favour of disclosure. The Christian Democrats concluded that ING was again the obstructing party in the failure to reach an agreement.[12] According to the Christian Democrats, ING had considerable influence on the employers' delegation in the Council on Annual Reporting, as it was a large contributor to the funds of the Employers Association, the Federation of Dutch Industries (VNO). In conclusion, the obstruction of the implementation of Article 406 by ING led to the Vreugdenhil/ Vermeend amendment.

Why was ING the foremost opponent to the requirements of the (draft) law? The CDA felt that of the companies constituting ING, NMB-Postbank and Nationale Nederlanden, it was the former which had the weaker shareholder equity position (interview with Mr Vreugdenhil).[13] In the merger process, significant transfers of equity funds had taken place to strengthen the NMB-Postbank's equity position. NMB-Postbank itself was established as a result of a merger between NMB and Postbank. It was NMB which had previously committed itself to an aggressive market policy which inherently entailed high risk. This high risk had had its effects on NMB's shareholder equity. Table 2 provides the reported equity of ING and NMB-Postbank in the relevant years. ING denied that equity transfers were the reason for their rejection of separate reporting. Instead, they stated that they had wished to present themselves as a single indivisible unit. This wish had a strategic origin. Some (financial) analysts had doubted the feasibility of financial conglomerates (Barkema *et al.*, 1992; Keiser, 1993; FD, 6-08-1993). ING, therefore, did not wish to emphasize that it was the result of a merger between two fields which were previously thought to be impossible to unite. In a way, separate reporting would signal to investors that the critics were right and that even ING was not certain of its own success (interview with Mr Badon Ghijben and Mr Kuijper).

TABLE 2

CONSOLIDATED EQUITY DEVELOPMENT: ING GROUP AND NMB-POSTBANK

	1989	1990	1991	1992	1993
ING Group	14,150*	13,874*	13,859	15,597	21,481
NMB-Postbank	4,944	5,346	5,902		

Source: Annual Reports of ING-Group (1992) and NMB-Postbank (1990 and 1991).
*pro forma combined amounts according to ING-Group annual report 1992

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[12] Another high-ranking INH officer, Mr J. Buitendijk, was a member of the workgroup which prepared the advisory paper.

[13] Mr Vreugdenhil based this observation on information that was conveyed to him by an employee of ING.

While ING did not favour the segmentation proposal, in the end it acknowledged that it was very likely that this proposal would become law. At that time, ING changed its strategy. As was noted before, ING's financial officer had a conversation with the Christian Democrats spokesman in April 1993. In this discussion, ING tried to convince the Christian Democrats that segmentation of shareholder equity would not provide useful information to the users. When this argument failed, ING put forward another aspect of the insurance draft which was considered undesirable by the insurance industry. Under the draft law (22896), real estate which was used by the company itself had to be depreciated (Explanatory Memorandum, 22896, nos 1–2, p. 9). Although there had been intensive discussions between the Justice Ministry and industry on this point, the ministry had not given in. In a letter to the Chamber's legislative committee, the Verbond van Verzekeraars had already asked the committee to amend this point. ING now suggested to the Christian Democrats spokesman to amend the draft in accordance with the wishes of industry. This could be viewed as a trade-off on the segmentation and the depreciation issues (interview with Mr Badon Ghijben and Mr Vreugdenhil).

A Brief Note on the Explanatory Framework: Pluralism

The detailed description of the behaviour of the participants and the events of the regulatory process enables an attempt to explain the empirical findings. It should be noted that the exploration of the case was conducted independently from the explanatory effort. Essentially, then, pluralism presents a view of the political process in which power is fragmented and diffused, although some individuals or groups have more power than others. The outcome of the political process is said to be dependent on the relative strength of the interest groups involved (Dahl, 1961; Hirschleifer, 1976; Becker, 1983). Sources of power are distributed non-cumulatively, and no one source is dominant (Ham and Hill, 1988). Dahl (1957) argued that the behaviour of agents pursuing different preferences in concrete decisions should be studied to describe the relative influence of interested parties. The pluralist tenet underlies the economic literature of the political process, more commonly known as public-choice theory (Mueller, 1989). Many researchers in accounting have adopted economic theories of regulation (Puro, 1984), or of democracy as proposed by Downs (1957) and Olson (1965) (Sutton, 1984; Lindahl, 1987), or of the firm (Watts and Zimmerman, 1978; Holthausen and Leftwich, 1983; Kelly, 1983). In this line of work the incentives and preferences of interested parties are outlined and an equilibrium prediction is generated based upon the resources agents commit to their purpose. Government is seen as an interest group itself, and the political process is depicted as a marketplace in which politicians compete for votes (Downs, 1957). Regulations are demanded and supplied (by government) in order to fulfil the self-interest of the actors in the process (Peltzman, 1976; McCormick and Tollison, 1981; Tollison, 1982). Accounting standards can thus be seen as products of a process in which regulations are set on the strength of the demands of effectively participating interest groups to fulfil the needs of the standard-setters (Rahman *et al.*, 1994). Regulation implies that certain agents are restricted in their implementation of *ex-*

ante plans; therefore, regulation results in wealth transfers (McCormick and Tollison, 1981). Choosing between two alternative reporting requirements, then, is similar to the choice between two wealth distributions (May and Sundem, 1976; Bryant and Thornton, 1984). Since agents are affected in their wealth by regulation, they have an interest in the regulatory process. In public choice theory, all agents are potential wealth suppliers as well as demanders. Attempts by agents to induce government to grant favours are costly (Tollison, 1982). If agents consider the costs of individual campaigning too high, they may combine their interests and undertake collective action. Then, organization costs will be incurred (Olson, 1965). Finally, the costs of employing a certain lobby instrument must be considered (Berry, 1977). In public choice theory, lobbying is, in the end, a cost/benefit trade-off. The entrance of an issue in the political process is often the result of a perceived crisis (Watts, 1977). Nobes (1991) argued that a wave of takeovers can provide the energy to start a regulatory process.

Pluralism has been criticized on two levels. First, political scientists have argued that power can be used to limit the scope of actual decision making to 'safe' issues. In such a fashion, the emergence of new demands for regulation is deterred. The analysis of decision making is then biased since it only incorporates (overt) influence attempts in innocuous issues, instead of the covert conflict in shaping the political agenda (Bachrach and Baratz, 1962). Moreover, Lukes (1974) argued that there is a third dimension of power, latent conflict, in which power is used to shape people's preferences so that no conflicts at all arise. Second, pluralism has been attacked because its assumptions might not be consistent with the political processes in the development of accounting standards (Walker and Robinson, 1993). Regulatory arrangements in accounting often involve complex and dynamic interactions between agencies. Pluralism does not explicitly address the intricacies of interorganizational relationships.

With regard to the political science critique on pluralism it should be noted that examining covert and latent conflict encounters ample empirical problems. Even the study of decision making in a pluralist context is often incomplete for the very reason that lobby success depends on secrecy. However, the case study design allows the collection of evidence of possible power exertion beyond that in overt decision making. Thus, although pluralist theory may not be able to explain this phenomenon, the research design that was adopted facilitated the collection of data that indicate whether there is evidence of covert or latent conflict. Whether the pluralist notion is applicable to explain political processes in accounting is an empirical question which is addressed in the discussion sections below.

Discussion of Field Reactions: The Position and Lobby Efforts of Users

Most users did not lobby intensively. User involvement in the formal regulatory process was largely restricted to participation in the Council on Annual Reporting. This is not unexpected since there is prior empirical evidence of the lack of user involvement in regulatory processes (e.g., Nobes, 1992). Moreover, lobbying is costly, and lobby efforts are said to be dependent on the resources at an agent's disposal (Blake, 1973; Becker, 1983). It should be remembered that the pluralist's notion of political processes asserts that resources are widely but unequally distributed, and consequently lobbying will be undertaken by certain groups only. Users, arguably, are not the wealthiest group. In this case, two user groups, however, did have substantial resources. First, the large investment firm that called the Christian Democrats' attention to the position of the users of financial conglomerates' reports. And second, the financial press, that is, FEM (a financial biweekly) and FD (a financial daily), which are widely read in the financial community, seemed to be critical and sometimes even hostile to the prevailing practice of financial conglomerate reporting. Editorial comments on the rule development of 'bancassurance' reporting stressed that vitally important companies should provide sufficiently detailed information in their annual reports. In particular, the concentration of power in financial conglomerates concerned the financial press. It was stated that more disclosure and better annual reports could contribute to the insight into the affairs of financial conglomerates. The relatively large number of articles that appeared on the subject indicates that considerable resources were devoted to this cause (FD, 2 May 1992, 13 November 1992; FEM, 13 June 1992; Hers, 1993a, 1993b; Keiser 1993). Moreover, the Christian Democrats used the articles in FEM and the FD in forming an opinion on the matter. Hence, these two users had an important influence on the resulting segmental reporting standard. The users in the Council had similar preferences for segmental reporting as the financial press and the investment firm. The preferences of the users are in line with prior findings in the literature. Users of financial statements are found to prefer as much disclosure of information as possible as long as it is provided freely (Mian and Smith, 1990). With regard to the question at hand, it should be noted that unconsolidated reports are generally more informative than consolidated financial statements in the sense that the information in a set of unconsolidated statements generally allows a user to perform a 'homemade' consolidation, particularly if the magnitude of the within-group contracting is reported or is small; the reverse, however, is not true (Mian and Smith, 1990). In the course of time, it is expected that the interdependencies between the banking and insurance part of financial conglomerates will grow. This will frustrate home-made consolidations by users. Then, a consolidated report will be valuable for this interest group, in addition to segmental information. Thus, the users' preferences are understandable in view of this analysis.

Discussion of Field Reactions: The Companies Involved

The companies involved in this bancassurance case are relatively new in their present form. The 1991 annual reports became the centre of attention because no regulation had yet been implemented. Therefore, these reports were the most likely to reflect the preferences of the companies involved. In the 1991 annual report of all seven[14] relevant companies, both banking and insurance activties were consolidated. Van der Tas (1993) showed that ING and Reaal copied the proposals (model) of the NVB/VvV workgroup for both the balance sheet and the profit and loss. ING adhered more closely to the proposal than Reaal. Table 3 reflects the segmental

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[14] These companies are: ABN-AMRO, Aegon, Fortis, ING, Levob, Reaal and RABO (Van der Tas, 1993).

TABLE 3

SEPARATE REPORTING BY FINANCIAL CONGLOMERATES IN 1991

Segmentation	Balance sheet	Profit and loss statement
ING	investments in nominal values	consolidated result per activity
Reaal	investments, placings, and loans	consolidated result per activity except other gains and losses
Fortis	separate consolidated statements for insurance, banking and general activities	separate consolidated statements for insurance, banking, and general activities
Levob	separation of equity in financial services, other activities, and insurance	no separate reporting
Aegon	no separate reporting	amount and composition of turnover and earnings before interest and taxes of non-insurance activities
ABN-AMRO	no separate reporting	no separate reporting
RABO	segmentation of all relevant items in both activities	segmentation of all relevant items in both activities

Source: Annual Reports and Van der Tas (1993).

information provided by the companies. This table supports the conclusion that Fortis disclosed the most information.[15]

The economics perspective on accounting method choice may be used to explain the preparers' preferences. Based on Mian and Smith's (1990) findings, it is argued that 'interdependence' is a major factor in explaining consolidation and disclosure preferences. Increased interdependence strengthens the preference for consolidation. Mian and Smith (1990) drew on transaction cost economics to argue that the more firm-specific an activity, the more likely it will be performed within a department or division and the less likely it will be subcontracted to an independent firm. The accounting decision on consolidation will then reflect the firm's choice of organizational structure (make or buy), which, in turn, is determined by the degree of interdependence between the parent and the subsidiary activities. The findings of the case suggest that these predictions are substantially accurate. All seven firms preferred consolidated reporting. And although the financial conglomerates disclosed substantial information, there was a clear borderline: the segmentation of shareholder equity was strongly opposed.

According to pluralism, preparers will have greater incentives and better prospects to lobby. In theory an agent will lobby to the point were the marginal benefits of lobbying equal the marginal costs. Preparers bear greater benefits of lobbying than users because the potential costs of regulation will generally be larger (see also, Sutton, 1984, p. 85). Indeed, empirical evidence substantiated the theoretical predictions in this case. It was primarily the preparers who lobbied. They had intensive contacts with the Justice Ministry in the drafting phase of both laws, and prior to that they were involved in European discussions pertaining to the two directives. Likewise, they also contacted the Christian Democratic Party presumably in an attempt to convince its representatives of their point of view.

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[15] Fortis held a somewhat special position in this case as it was a transnational merger, being the result of the merger between the Dutch VSB/AMEV and the Belgian AG. The choice for separate reporting of bank and insurance activities may be attributed to the special structure of Fortis as it had two parents, AG Group and N.V. AMEV, neither of which is a part of Fortis. Both parents have a 50 per cent interest in Fortis, through a 50 per cent interest in AG 1824 and AMEV/VSB 1990. The AG Group participates in AMEV/VSB 1990 through its 94 per cent subsidiary AG 1990 N.V. and the 100 per cent subsidiary of the latter, AG 1990 (Netherlands), in which they perform their operational activities.

A large agent's expected total benefits are more likely to exceed lobbying costs than a small agent's. Thus, large agents can be expected to lobby most ardently (Olson, 1965). The group of companies involved in the financial conglomerate case was not of homogeneous size. ING was by far the most important mixed financial firm. Fortis was likewise of considerable importance. Indeed, ING appeared to be the most active lobbying party. Even Fortis did not seem to play as important a part as ING, although it was certainly involved, for example, in its contacts with the Justice Ministry and in the preparation of the NVB/VvV advice. The contacts with the Justice Ministry were, however, the result of initiatives on the side of the ministry itself. Therefore, the prediction is corroborated to the extent that only very large companies with significant interests in the regulatory process would attempt individually to influence the outcome. An important part of the lobbying was performed collectively by the joint initiative of the two industry associations involved, the NVB and VvV. It should be noted that since accounting regulation exhibits the characteristics of a public good, no agent can be excluded from its benefits after implementation. Therefore, little incentive exists to contribute to the costs of lobbying. Unless a cost-sharing rule is agreed upon, free riding is likely to occur. Industry associations are then likely candidates to represent the views of preparers of financial statements. In contrast to *ad hoc* lobby groups, industry associations have established cost-sharing rules, and other measures for facilitating effective collective action. Moreover, they do not encounter start-up costs which ensue from initiating an organization which unifies agents with similar interests. The joint NVB/VvV workgroup was supplied secretarial support by NVB. Moreover, the workgroup was formed by members of both industry associations. As such, this workgroup participated intensively in the process at relatively low costs.

Some companies appeared to dominate the collective actions, although all of the important companies provided some input. When intensities of preferences over a certain item differ between members of a lobbying group, log-rolling may occur. Lobbying seemed to be aimed at the Council on Annual Reporting. In the workgroup formed by this Council, there was support for ING's position. Subsequently, the representatives of the employers' organizations readily supported ING's position in deliberations on the floor of the Council. Comparing the 1991 annual reports of the financial conglomerates with the NVB/VvV proposal, it appeared that ING's annual report was the most in line with this proposal. Therefore, and in light of the results of the interviews, it seems reasonable to suggest that log-rolling took place in favour of ING's preferences when drafting the NVB/VvV advice, and in the employers' delegation of the Council. The conclusion seems all the more legitimate because Fortis, the other major player in the field, had a completely different disclosure preference.

One of the respondents pointed out that it was unlikely that captains of industry would participate in demonstrations.[16] Indeed, most lobbying occurred through some form of information transfer. It is interesting to note that the government itself explicitly solicited the transfer of information (e.g., NVB/VvV advice). Not only did the industry transfer information by publishing an advisory statement, it also participated in the exchange of views while the new legislation was being debated. The lobby method of information transfer from agents to the standard-setter, and especially subsidizing 'independent' or 'expert' information that supports the position of an agent, has long been recognized in the literature (Bartlett, 1973; Watts and Zimmerman, 1979). Information transfer is not the only way agents put their views on the stage. Private conversations and informal meetings with members of parliament, and representatives of government (politicans as well as civil servants) are among the most effective lobbying instruments, and were used by the producers of financial accounts.

With regard to the timing of the lobbying, the prediction is that effective lobbying would occur as early in the process as possible. Lobbying is likely to be most successful if it takes place before a civil servant sets pencil to paper for the first time to write a proposal. Once a certain regulation is enacted, the possibilities of changing its implications are limited (Sutton, 1984; Van Schendelen, 1988). One of the most successful lobbying efforts was undertaken by the large investment firm which contacted the Christian Democrats Party at an early stage of the process. Although industry representatives engaged in talks with the Justice Ministry regarding the draft laws, the most intense lobbying occurred relatively late in the process, when ING's financial officer talked to the Christian Democrats' spokesman in April 1993. Apparently, the Christian Democrats had already made up their mind on this issue and the efforts of industry proved to be futile.

Discussion of Field Reactions: Auditor Involvement

The market for audit services for financial conglomerates is characterized by a duopoly. The market is almost completely dominated by two audit firms: Moret, Ernst & Young (MEY) and KPMG. There are only a few contemporary statements of the opinion of auditors regarding the financial conglomerates issue. One of the most interesting was made by the MEY vice-chairman of the board while presenting the MEY annual report 1991. He declared that it was the opinion of MEY that separate reporting should be required for those financial conglomerates which had equally large banking and insurance activities (FD, 25 March 1992). This opinion diametrically opposed the interests of MEY's (large) clients, who were only willing to implement separate reporting to a limited degree. Moreover, it should be noted that the vice-chairman's ideas conflicted with the proposals made by NVB/VvV. The vice-chairman made his statement after the joint NVB/VvV advice was published, but before parliament discussed the draft law. Although remarkable, this statement does not seem to have had an important impact on the political process, as the

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[16] In the recent intense controversy in the U.S.A. over recognizing the compensation expense implicit in stock option plans, however, companies that objected to the FASB's proposal hired a band and demonstrated loudly outside the FASB's hearing room.

Christian Democrats Party appeared unaware of it. However, the Justice Ministry was somewhat disconcerted that one of the largest auditing firms in the country appeared to be taking a position which clearly diverged from the Ministry's policy. Hence, MEY was contacted by the Justice Ministry to find out whether this was indeed an official position taken by the firm regarding this issue. MEY made it clear that there was no such position and that the vice-chairman's statement reflected only his personal views (interview with Ms Wortmann). One of the large clients of MEY was ING. The ING assignment partner at MEY held quite a different opinion on the issue than his vice-chairman; he supported the idea that ING should present itself as a single indivisible unit. ING's top financial officer was rather annoyed with the statements by MEY's vice-chairman (interview with Mr Badon Ghijben). In an attempt to convince ING of their good intentions, MEY officials referred to their vice-chairman's comments as 'an internal communications error'.

With regard to the position of auditors, the literature suggests that they face a number of incentives, which are not mutually exclusive. Watts and Zimmerman (1986) argued that audit firms have incentives to lobby for standards that increase their value; an increase in value will be expected if audit fees rise due to increased audit services which originate, for example, in the examination of previously separated reported activities. Consequently, auditors will favour consolidation. Furthermore, when separate statements on activities have to be provided to prevent information loss, additional audit services can be expected, and auditors can be expected to favour separate statements. Auditors have, in addition, an incentive to support their clients' positions (Haring, 1979; Puro, 1984, 1985). Puro showed that, although in lobbying the FASB audit firms did not support their clients in disclosure matters, they did support their client's position on measurement issues. In this case, it is then expected that auditors and their clients will disagree on the disclosure of segmental information. The prediction is that auditors will lobby for segmental reports while preparers are expected to lobby against it. The empirical findings in this case suggest that auditors did *support* their clients, even in disclosure matters. Thus, Puro's (1985) findings were not corroborated, but evidence was found in support of Watts and Zimmerman's (1986) 'audit fee hypothesis'. The pluralist notion that only large audit firms will be involved in lobbying the standard-setter was also corroborated. Indeed, only Big-6 firms (KPMG; Moret, Ernst & Young; Touche Ross) played a part in the political process.

CONCLUSION

Pluralism states that the agent that commits the most resources to lobbying is more likely to see his preferences reflected in the standard (Becker, 1983). The standard that was implemented by parliament (Article 406) mirrored mostly the preferences of users, that is, consolidation of both bank and insurance activities, and substantial segmental information including information about the allocation of shareholder equity. Although prior beliefs might indicate that preparers, as the most wealthy party, would have the most influence, the financial conglomerate case showed that the combined lobby efforts (resource dedication) of users were substantial. Especially, the input of a large investment firm and the financial press played an important role. The regulatory effort was the result of a 'crisis', namely, the unanticipated merger of banks and insurance firms. The analysis showed that there were several interested parties in the forging of Article 406. From the outline of their preferences it can be implied that the producers of accounts were not a cohesive block. However, they lobbied for a standard that accommodated each of their views. Auditors did adhere closely to the preferences of the companies to which they were affiliated. In contrast to some earlier findings (Puro, 1985; Rahman *et al.,* 1994), producers and auditors clustered when presenting their views. Users and the Dutch Central Bank opposed the producers and auditors with regard to their disclosure preferences. Government was involved in the process, mainly through two 'agencies': parliament and the Justice Ministry. The interested parties differed in the opportunities they had to participate in the formal promulgation process. Moreover, they differed in the degree they appeared to have access to decision makers at key governmental positions. Preparers and the Dutch Central Bank, for example, had ample opportunities to engage in the preparatory phase of the regulation process because they were involved with the EC discussions on the banking and insurance directive, and because the Justice Ministry sought to incorporate the preparers' views in the draft law and, therefore, asked for contributions to the process. The preparers and the large investment firm also had direct access to the Christian Democrats Party. Other users were confined to indirect means like newspapers to convey their views. Although companies, in general, seem to have institutionalized their involvement in accounting standard setting, and thus might be better capable of presenting their views, in line with the pluralist tenet, other interested parties were able to effectively voice their opinion in the process and have some influence in the political process.

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Other Sources

Below, an overview is presented of the parliamentary documents used in this study. The Dutch terminology is used.

Kamerstukken	Tweede Kamer	vergaderjaar 1990-1991	22169	A-B, 1-3
		vergaderjaar 1991-1992	22169	4-9
		vergaderjaar 1992-1993	22169	10-15
Handelingen	Tweede Kamer	10 November 1992	22169	TK20
				TK22
Kamerstukken	Eerste Kamer	vergaderjaar 1992-1993	22169	84
				84Herdruk
				84a-c
Handelingen	Eerste Kamer	16 March 1993	22169	EK21

Staatsblad		1993	258	
Kamerstukken	Tweede Kamer	vergaderjaar 1992-1993	22896	A-B, 1-11
Handelingen	Tweede Kamer	1 July 1993	22896	TK86
Kamerstukken	Eerste Kamer	vergaderjaar 1992-1993	22896	323, 323a
Handelingen	Eerste Kamer	14 September 1993	22896	EK37
Staatsblad		1993	517	

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STEWART JONES AND NINA PUGLISI

The Relevance of AAS 29 to the Australian Public Sector: A Cause for Doubt?

In December 1993, the AARF issued Australian Accounting Standard AAS 29, *Financial Reporting by Government Departments*. The Standard requires all Australian government departments (GDs) to adopt comprehensive accrual financial reporting no later than 30 December 1996. Given the magnitude and potential financial cost of these reforms, the claimed benefits of AAS 29 justify empirical investigation and scrutiny. The purpose of the present study was to test underlying rationales of AAS 29 by reference to ratings and opinions of 172 federal and state GDs in Australia. The key rationale of AAS 29 is that accrual-based financial reports will be relevant to the economic decision making of GDs and their external users. While the empirical results presented in this paper are confined to the internal viewpoints of senior GD officials and representatives, they cast into doubt the relevance of AAS 29 in the Australian public sector.

Key words: Accrual accounting; Governmental accounting; Surveys.

In December 1993, the Australian Accounting Research Foundation (AARF) issued Australian Accounting Standard AAS 29, *Financial Reporting by Government Departments*, on behalf of the Public Sector Accounting Standards Board (PSASB) and the Australian Accounting Standards Board (AASB). The standard is based on exposure draft ED 55, *Financial Reporting by Government Departments*, which was issued for public comment by the AARF in 1993.[1] The standard requires all government departments (GDs) in Australia to comply with its accounting and disclosure provisions in reporting periods no later than 30 December 1996. The technical and conceptual provisions of AAS 29 are exceedingly detailed, containing over 190 regulatory requirements and over fifty pages of relevant commentary.

[1] There were no significant amendments to AAS 29 from its antecedent document ED 55. The exposure draft was in turn based on the recommendations of a Discussion Paper No. 16, 'Financial Reporting by Government Departments' (Sutcliffe *et al.*, 1991), issued by the AARF in 1991.

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Compliance with these provisions will, without question, fundamentally reshape the nature and character of financial reporting by GDs (see Sutcliffe *et al.*, 1991).

The salient features of AAS 29 are: conformity to the reporting entity concept (where financial reporting is assumed to serve the needs of external users); and the preparation of an annual operating statement, statement of financial position and statement of cash flows consistent with the requirements of all relevant professional Australian accounting standards.[2] These annual financial statements (hereafter general purpose financial reports or GPFRs) must recognize and disclose all assets, liabilities, revenues and expenses which meet the definition and recognition criteria outlined in Statement of Accounting Concepts SAC 4, *Definition and Recognition of the Elements of Financial Statements*.[3] AAS 29 also requires depreciation of all non-current assets consistent with professional accounting standards, and recommends recognition and disclosure of infrastructure and heritage assets at their written down current cost.[4]

The provisions of AAS 29 are, in part, the product of an accelerating trend towards adoption of accrual accounting in the Australian public sector generally (see Sutcliffe *et al.*, 1991 and recommendations of JCPA, Reports 338, 341, 1995). It is also noteworthy that the issue of accrual accounting in the public sector has attracted considerable international attention and interest.[5]

Whether or not the introduction of accrual accounting practices has, or will, improve the decision relevance of financial information provided to external users cannot be evaluated from the present dearth in Australian public-sector accounting research. Curiously, AAS 29, a standard of potentially great consequence to the public sector, not to mention potential cost to the taxpayer, has been issued by the AARF seemingly without significant empirical research to support the standard's underlying rationales and assumptions.

The primary purpose of this paper is to test three underlying rationales of AAS 29 by reference to the perceptions and attitudes of senior GD officials and representatives. These rationales are as follows[6]:

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[2] However, GDs are not required to comply with AAS 16 'Financial Reporting by Segments' and AAS 22 'Related Party Dislcosures'.

[3] Assets and liabilities are defined in the context of probable future economic benefits/dispositions of resources.

[4] AAS 29 also requires additional disclosures regarding compliance with Parliamentary appropriations.

[5] The only Western country where comprehensive accrual accounting is now generally adopted by all GDs is New Zealand. Other countries such as the UK, the US and Canada employ various modified systems of accrual accounting (Hepwoth and Vass, 1984; Sutcliffe *et al.*, 1991); Aiken and McCrae, (1992), but there appear to be moves to introduce accrual financial reporting in these jurisdictions (see JCPA, 1995).

[6] The first two rationales are stated under 'Purpose of the Standard' in the opening paragraphs of AAS 29 (see Accounting and Auditing Handbook, ASCPA, 1996, pp. 638–639). While the third rationale is not explicitly stated by AAS 29, it is clearly implied throughout the Standard's detailed commentary sections.

1. GPFRs will provide relevant information to the economic decision making of a number of public-sector external users, including parliamentarians, taxpayers, consumers, donors and special interest groups;
2. GPFRs will provide relevant information for a GD's own internal decision making, particularly in the area of performance evaluation, assessments of financial position and evaluation of financing and investing activities;
3. The provisions of AAS 29 can be readily implemented by GDs. That is, there are no major technical restrictions or other elements that can potentially prevent AAS 29 from achieving its financial reporting objectives of providing relevant information to users.

The survey was undertaken in 1993–94 and the results reported and analysed are based on the replies of 172 senior representatives of state and federal GDs. These results will be useful for evaluating aspects of the present and future progress and direction of accrual accounting in the Australian public sector, as well as providing a foundation for future research, both in Australia and overseas.[7]

RESEARCH PROCEDURE

The Instrument

For the purposes of this study, a government department accrual accounting questionnaire (GDAAQ) was developed. It comprised 241 questions, many of which were broadly related to: the relevance of accrual accounting to the internal decision making of GDs; the perceptions of senior GD officials about the relevance of accrual accounting to a range of external user groups; and the potential obstacles that could confront the successful implementation of AAS 29. Many questions were closed-ended and rated on 5-point Likert attitudinal or rating scales, from 'strongly agree' to 'strongly disagree', 'very significant' to 'not significant'; and 'excellent' to 'poor'.[8]

Reliability of Measure

The internal validity of all major GDAAQ items was tested using Cronbach's alpha (Emery and Cooper, 1991). When these items were subjected to Cronbach's alpha, the standardized alpha reliability coefficient was greater than 0.8. This is an acceptable level of reliability and indicates that the GDAAQ was likely to be measuring a single factor (Cohen *et al.*, 1988).

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[7] Australia has moved more rapidly towards adoption of public sector accrual accounting than most other Western countries, except New Zealand (see Aiken and McCrae, 1992). Data in this paper could assist international standard-setters, regulatory agencies and academics assess the relative merits of introducing comprehensive accrual accounting for GDs in different jurisdictions, particularly in the UK, the USA and Canada (see Sutcliffe *et al.*, 1991).

[8] A covering letter accompanied the GDAAQ and outlined the purpose of the research. It is noted that at the time the survey instrument was sent out to Australian GDs in July 1993, AAS 29 had not officially become an Australian accounting standard. Hence, the survey instrument refers to ED 55 rather than AAS 29. There were no significant differences between ED 55 and the final document issued as AAS 29. Because the use of different terminologies can cause unnecessary confusion, the present study refers to AAS 29 instead of ED 55.

Procedure and Response Rate

The GDAAQ was forwarded to 298 senior representatives of Australian GDs, drawn from almost the entire population of Australian federal and state GDs (excluding their regional divisions). The sample was generated from the comprehensive listing of the *Australian Commonwealth Government Directory* (1993), which also included state GDs. Questionnaires were mailed to subjects who were invited to complete and return the questionnaire in post-paid reply envelopes. In order to minimize potential problems associated with random sampling error, considerable effort was devoted to ensuring an adequate response rate to the GDAAQ. The procedure resulted in a response rate of 71 per cent ($n = 172$ usable surveys),[9] from a sample of 243. The sample size was reduced from the original 298 due to 22 subjects being misclassified as GDs, 21 GDs classifying themselves as merely a division of another GD, with 12 questionnaires proving unusable.

Of the 172 usable responses, two distinct groups emerged: directors, managers and senior government officers, comprising 71.5 per cent; and accountants, financial controllers, analysts and others, comprising 28.5 per cent. Respondents generally had considerable public-sector experience, the average experience exceeding fifteen years. The average private sector experience, however, was considerably less, being under five years. In terms of respondent GDs, the annual budget of GDs averaged between a range of \$70–100m ($n = 155$).[10] In terms of primary accounting systems used by GDs, 53.0 per cent ($n = 162$) of respondents used predominantly cash-based accounting systems (i.e., excludes all accrual items), whereas 27.1 per cent ($n = 162$) used some form of modified accrual accounting system (i.e., includes only some accrual items). Approximately 13 per cent ($n = 162$) of respondents indicated that their GDs were already preparing financial reports (mainly for internal reporting purposes) on a predominantly full accrual accounting basis.[11] Respondents were also surveyed on the primary financial objectives of their GD. For instance, do GDs have profit-making objectives, full cost recovery objectives, partial cost recovery objectives or no cost recovery objectives? It was anticipated that attitudes to AAS 29 could be influenced by a GD's underlying financial objective. Responses indicate that the majority of GDs had either partial or no cost recovery objectives (62.8 per cent, $n = 137$), whereas 35.5 per cent ($n = 104$) of respondents indicated having full cost recovery objectives.

[9] Because we encountered difficulties in identifying appropriate respondents to complete the questionnaire (including the usual problems of having to follow-up on tardy respondents), four follow-up reminder letters were eventually sent out over an eight month period. Furthermore, the follow-up letters were supplemented with phone calls and facsimile messages to non-respondents.

[10] These average values have been expressed in terms of a range (as opposed to a single value ie., the arithmetic mean) because respondents were not expected to know the exact size of their GDs. Hence, the questionnaire suggested a range of values.

[11] The remainder of respondents indicated they were unsure of the basis of accounting their GD reported on. Not surprisingly, most of the GDs using comprehensive accrual accounting were located Federally, and in the States of New South Wales and in Victoria, where accrual accounting programs have been sponsored in recent years by relevant government authorities (see Sutcliffe *et al.*, 1991; recommendations of ICPA, Report 338, August, 1995).

Study Limitations

Readers should interpret the results of this study cautiously in the light of several possible limitations. One limitation relates to the measure. The questionnaire was pretested on a number of academics, particularly for content and face validity, but was not tested for construct validity. Another possible limitation relates to non-response error. Approximately 30 per cent of subjects did not respond to the survey. Non-response error was tested statistically by comparing some underlying characteristics of respondents with the non-respondent group. Non-respondents were telephoned[12] and asked a number of questions relating to their occupation, experience, size of their GDs, and several questions on their attitudes to AAS 29 provisions and the potential users of the financial accounts of GDs. Statistically non-significant findings were reported on nearly all of these variables, suggesting that the respondent group is likely to be representative of the non-respondent group.

LITERATURE REVIEW AND SURVEY RESULTS

The three rationales outlined above are now examined in the context of relevant literature and survey findings.

Rationale 1

GFPRs will provide relevant information to the economic decision making of a number of public sector user groups

The concept of 'user needs' has a pivotal role in Australian (and international) conceptual framework(s). To reiterate, SAC 1 asserts that the primary rationale for any entity to prepare GPFRs is based on the existence of external users. SAC 2 reinforces this by stating that the primary goal of GPFRs (in both the private and public sectors) is to provide relevant and reliable information to external users. Consistent with the conceptual framework, the accrual accounting provisions of AAS 29 (paras 18–23) are explicitly linked to external users and their presumed dependence on the GPFRs for economic decision making. The standard also asserts user characteristics which will be served by GPFRs: 'General purpose financial reports are reports intended to meet the financial information needs common to a potentially wide range of users who are unable to command the preparation of reports tailored to their individual needs' (para 18). AAS 29 (para. 21) identifies several potential implicit and explicit users to be: parliament, taxpayers, creditors, consumers, donors, regulators, and special interest groups (e.g., community groups, the media). While the standard (para. 23) identifies parliament to be the most important user (cf. Likierman and Taylor, 1990) no indication of the relative importance of other potential users is provided by the standard. However, other publications of the AARF indicate that *resource providers* (notably taxpayers, donors, consumers and businesses), are likely to have a particular interest in GPFRs for making and evaluating economic decisions (see Sutcliffe *et al.*, 1991; Micallef, 1994). Another feature of AAS 29 (para. 18) is that external users in the GD sector are assumed to have common information needs which can be satisfied by GPFRs. After all, it is the capacity of financial statements to satisfy a range of users that afford them their general-purpose character.

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[12] The survey was serially numbered in large block numerals. As a result, non-respondents could be contacted. The covering letter made it clear that confidentiality (not anonymity) would be guaranteed.

In contrast to the opinion of the accounting profession, and its research arm, AARF (see, Peirson Report, 1990; Sutcliffe *et al.*, 1991; McGregor, 1993), much of the academic literature appears unconvinced that the resource allocation decisions of public-sector external users will be enhanced by the provision of GPFRs (see, as examples, Chambers, 1955; Aiken, 1979; Walker 1990; Ma and Mathews, 1992a, 1992b, 1993; McCrae and Aiken, 1994). Furthermore, many doubts have been expressed as to whether public-sector users have common information requirements which can be satisfied by GPFRs (e.g., see Mautz, 1981; Aiken and McCrae, 1992), a view also expressed in the private-sector literature (see, Griffin, 1987). The above academic literature identifies several factors likely to impinge on the relevance of accrual financial reporting to public sector users, including:

1. GDs are not perceived to be reporting entities. They are merely segments of the 'Crown' or agents of the executive government, having no legislative powers to incur or extinguish liabilities, nor authority to sell, dispose of or significantly redeploy assets without central government approval. Hence, concepts such as 'financial position' and 'performance' could have limited relevance to public-sector users.
2. Evaluation of a GD's 'efficiency' and 'effectiveness' through GPFRs could be essentially meaningless to users because GDs operate without a profit motive, and even without cost recovery objectives in most instances.
3. The production of GPFRs is not necessarily cost/benefit effective because the allocation of scarce resources among essential government services could be determined by a variety of socioeconomic, public welfare and political constraints, rather than on accounting measurement/financial disclosure considerations.

The external users of GPFRs were investigated in the present study by requesting respondents to rate the relevance of GPFRs to the users identified by AAS 29, notably parliament, taxpayers, consumers, creditors, regulators, other government departments, donors and other resource providers. We have relied on the attitudes and opinions of senior internal members of GDs for the following three reasons:

1. There are a number of pragmatic methodological difficulties which render it inexpedient to examine external users *directly* in the public sector. Each external user group identified in AAS 29 would present a unique problem. For example, it is difficult to examine whether taxpayers and consumers rely on GPFRs because the sampling frame would theoretically include all Australian citizens. With parliamentarians, there are likely to be serious problems pertaining to access and response error to consider. The present findings could, however, provide a useful starting point for future research on the actual users of GPFRs in the public sector.
2. A major objective of the present study was to collect data regarding a GD's use of GPFRs in various aspects of its own internal decision making. For this purpose, it was more appropriate to approach internal members of GDs.

3. Arguably, internal representatives of GDs have a better 'vantage point' than regulators, or professional research bodies such as the AARF, to evaluate whether or not their departments have external users dependent on GPFRs.

Rationale 1: Survey Findings

Table 1 displays respondent ratings of whether GDs are likely to have external users dependent on GPFRs for economic decision making. It is acknowledged that respondent ratings of external users are based entirely on perception, as most Australian GDs presently do not prepare GPFRs.

Results in Table 1 indicate that subjects rated parliament to be potentially the major user of GPFRs. This stands to reason, given that parliaments in Westminster countries have political and legal authority over the activities and performance of all GDs. Special interest groups (such as the media) were also rated as a relatively significant perceived user group by respondents. Regulators and 'other government departments' were rated as fairly modest users of GPFRs, whereas all other user groups listed in Table 1 were given fairly negligible ratings by subjects.

While these findings indicate that certain external users could potentially benefit from the disclosure of GPFRs by GDs, the results appear to fall far short of the claims of AAS 29 that GPFRs could satisfy a 'potentially wide range of users'. Indeed, the relatively low ratings given to all manner of resource providers and consumers is particularly revealing insofar as the AARF has often emphasized the importance of these user groups in its justification for accrual financial reporting in the public sector (see, Sutcliffe *et al.*, 1991; JCPA, Report 341, November 1995). Furthermore, while parliament was rated highly as a perceived user of GPFRs, there is some doubt whether parliament constitutes an external user group within the definition and context of AAS 29 and the conceptual framework. Accounting

TABLE 1

RATINGS OF THE POTENTIAL EXTERNAL USERS OF THE GPFRs OF GOVERNMENT DEPARTMENTS

Potential external users of the GPFRs of government departments	*n*	Agree or strongly agree (%)	Mean scores X^a	Mean scores *SD*
Parliament	169	90.5	1.822	(.658)
Other government departments	166	58.4	2.524	(.899)
Taxpayers	163	30.7	3.110	(.949)
Creditors	158	15.2	3.367	(.884)
Resource providers	161	31.1	3.050	(.967)
Consumers	163	23.9	3.202	(.924)
Donors	156	14.7	3.455	(.890)
Special interest groups	167	67.1	2.323	(.763)
Regulators	165	59.4	2.503	(.941)

[a] Lower mean scores indicate higher ratings of agreement. (i.e. 1='strongly agree'; 5='strongly disagree').

standards are designed largely for the benefit of external users, that is, users who are unable to command the preparation or influence the supply of financial information. AAS 29 is conceptually suspect on this issue because parliament has potentially unlimited authority to command the preparation of any financial information it seeks from GDs, including special purpose reports which, of course, it now requires periodically under detailed annual reporting legislation and regulation.

A related assumption of AAS 29 is that external users are likely to have common information needs which can be satisfied by GPFRs. In order to examine this assumption, the questionnaire requested respondents to consider whether different classes of users are likely to have common information needs. Table 2 reports these results.

There are certain consistencies in the results of Tables 1 and 2. For instance, the findings indicate that user groups which were rated highly in Table 1 were also the same users perceived by subjects to have common information needs. However, the overall results suggest that respondents did not expect many classes of users to have common information needs which can be satisfied by GPFRs. It is possible that public-sector external users are perceived by subjects to have more specialized information needs or possibly no financial information needs at all. Notwithstanding that this issue needs more research attention, the ratings of respondents cast some doubt on the relevance of GPFRs to public-sector users.

Subjects were also asked several questions relating to the relevance of AAS 29 in the public sector more generally. Replies to these questions appeared to be strongly linked to the external user issue. For example, statistical testing revealed that unfavourable ratings of the relevance of GPFRs to external users tended to be more strongly correlated with respondents who either: (a) did not support the issuance of

TABLE 2

RATINGS OF WHETHER EXTERNAL USERS HAVE COMMON INFORMATION NEEDS WHICH CAN BE SATISFIED BY GPFRs

Common information needs of external users which can be satisfied by GPFRs	n	Agree or strongly agree (%)	Mean scores X^a	*SD*
Parliament	166	65.1	2.422	(.961)
Other government departments	148	64.2	2.385	(.787)
Taxpayers	149	41.6	2.846	(.935)
Creditors	146	34.2	2.911	(.939)
Resource providers	147	40.8	2.803	(.984)
Consumers	146	33.6	2.925	(.903)
Donors	145	33.8	2.945	(.919)
Special interest groups	165	53.9	2.515	(.838)
Regulators	148	56.1	2.507	(.915)

[a] Lower mean scores indicate higher ratings of agreement (ie., 1='strongly agree'; 5='strongly disagree').

AAS 29 by the AARF[13]; (b) did not agree that the benefits of AAS 29 would exceed its overall costs[14]; or (c) did not plan to comply substantially with most of the provisions of AAS 29 at the end of 1996.[15]

These findings suggest that respondents' perceptions of user needs for GPFRs, and not other factors (such as disagreement over the specific provisions of AAS 29), was the driving factor influencing respondent opinion about the relevance of AAS 29 in the public sector more generally.[16]

Another noteworthy result is that representatives of GDs which were already adopting a full or modified accrual basis of accounting tended to rate more highly the relevance of GPFRs to external users.[17] This result suggests the presence of a potential 'experience effect' (Watts, 1995, pp. 325–30). That is, GDs which have greater experience in preparing and utilizing accrual accounting information appear more convinced (relatively speaking) about its usefulness to external users.[18] Going on this result, it is possible that the generally negative respondent attitudes to the relevance of GPFRs could change once AAS 29 has been implemented and trialled by GDs for a period of time. This is an issue worthy of future research after the 1996 deadline for the standard's implementation.

Rationale 2
GPFRs will provide relevant information to a GD's own internal decision making

While AAS 29 emphasizes that its primary objective is to serve external users, the standard also states that GPFRs could have relevance to a GD's own internal decision evaluations and assessments (see Preface, 'Purpose of the Standard', AAS 29, p. 1). One decision area which has attracted considerable attention in the public sector is 'performance evaluation' (see, e.g., Jones and Pendlebury, 1984; Hopwood, 1984; Carpenter, 1986; Guthrie *et al.*, 1990; Fuller and Roffey, 1993). The shift in recent years from issues of fiscal compliance to the broader and more encompassing concept of performance evaluation in the public sector has been echoed in the AAS 29 (see also JCPA, Report 338, August, 1995). The standard states that GDs should be accountable for all the resources they control, the liabilities they incur, the achievement of their operating objectives (the cost of services provided, and the recovery of cost), the efficiency and effectiveness with which they use resources and provide services, as well as for compliance to spending mandates (see, e.g., Preface to the standard, paras 44, 47, 51). In addition to performance evaluation, the specific decision contexts in which GPFRs are envisaged to be useful (for both external and internal decision making) are stated generically in the standard to be: financial position; financing and investing activities; and compliance (see para. 5).

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[13] About 54.3% ($n = 164$) of respondents either agreed or strongly agreed that ED 55 should not be issued as an Accounting Standard.

[14] About 52% of respondents agreed or strongly agreed with questionnaire items that the benefits of AAS 29 would not exceed the costs.

[15] A significant minority, 32.7% ($n = 165$) of respondents indicated they would only comply with certain or very few of the Standard's regulatory requirements.

[16] This conclusion is supported in the results. For instance, most respondents actually supported the accrual accounting requirements of ED 55 in spite of the fact that they did not support issuance of the document as a Standard. Between 65% and 75% ($n =$ approximately 162 for each case) of respondents either agreed or strongly agreed with key aspects of the Standard, including: definition and applicability of the reporting entity concept to GDs; the depreciation and revaluation of non-current assets (other than infrastructure and heritage assets, which was opposed by the majority of respondents); the disclosure regulations for GPFRs; and recognition criteria for assets, liabilities, revenues and expenses. While there were more concerns by respondents with definition criteria for elements of GPFRs, the results appear to confirm that representatives of GDs generally support the basic tenets of accrual accounting. Negative attitudes to AAS 29 appear to be associated more with its decision relevance to users.

[17] Government departments which were already preparing full or modified accrual-based financial reports rated users of GPFRs significantly more highly than other GDs. These statistics are reported as follows: creditors ($t = -4.32$, $p = .000$); other GDs ($t = -4.79$, $p = .000$); other resource providers ($t = -3.29$, $p = .001$); consumers ($t = -3.38$, $p = .001$); donors ($t = -2.73$, $p = .007$); special interest groups ($t = -4.26$, $p = .000$); and regulators ($t = -5.01$, $p = .000$).

[18] This particular finding was not associated with the professional background of respondents (i.e., accountant vs non-accountant) nor with the financial reporting experience of particular respondents.

Rationale 2: Survey Findings

In order to evaluate the relevance of GPFRs to a GD's internal decision making, the survey questionnaire requested respondents to rate the relevance of comprehensive accrual accounting vs cash accounting across nineteen decision contexts pertinent to the broad decision categories outlined in AAS 29. Table 3 reports these ratings.[19]

Results in Table 3 suggest that accrual accounting was perceived to have relevance across certain decision contexts. However, the overall impression of respondent ratings is that accrual accounting has only a fairly modest relevance to the internal decision making of GDs. For instance, the results in Table 3 indicate that only one decision context of accrual accounting was rated close to '2' (or 'agree') on the Likert scale, with all other decision contexts being rated above this value. Furthermore, there were a number of decision contexts in which the relevance of accrual accounting was rated rather lowly by respondents, including several decision items identified as significant by AAS 29. These decision contexts included 'evaluation of investing activities' (see AAS 29, para. 5) and 'achieving full cost recovery' (see AAS 29, para. 44). The low ratings for 'evaluating investing activities' undoubtedly reflect the highly restricted powers of Australian GDs to invest budgeted funds or surpluses into investment pools/projects. It is plausible that 'achieving full cost recovery' was not rated highly by subjects because most GDs do not appear to have explicit full cost recovery objectives.

Other decision contexts mentioned in AAS 29 which were rated rather lowly by respondents included 'liquidity' and 'solvency' evaluation. A primary rationale provided by AAS 29 for requiring disclosure of assets and liabilities is to afford users with sufficient information to enable assessment of a GD's financial structure and capacity for adaptation (see para. 47). In both types of evaluation, AAS 29

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[19] It is acknowledged that there are a number of possible overlaps within the decision contexts reported in Table 3. Furthermore, they are intended to be representative rather than exhaustive of all possible contexts.

TABLE 3

WHETHER ACCRUAL ACCOUNTING (AS PROPOSED BY AAS 29) BETTER REFLECTS THE FINANCIAL AND NON-FINANCIAL ASPECTS OF A GOVERNMENT DEPARTMENT'S ACTIVITIES BETTER THAN CASH ACCOUNTING

Decision relevance of accrual accounting (as proposed by AAS 29)	*n*	Agree or strongly agree (%)	Mean scores X^a	*SD*
Evaluating financing activities	148	62.8	2.297	(.922)
Evaluating investing activities	141	46.1	2.489	(.931)
Evaluating operating activities	149	76.5	2.101	(.860)
Monitoring cash flow position	150	52.0	2.653	(.987)
Monitoring financial position	150	80.7	2.040	(.793)
Monitoring profitability position	141	48.6	3.220	(1.185)
Evaluating liquidity	142	40.9	2.863	(.970)
Evaluating solvency	140	37.8	2.700	(.972)
Determining budgeting requirements	149	49.7	2.850	(.962)
Measuring government performance	150	70.7	2.240	(.917)
Measuring managerial performance	150	61.33	2.540	(1.831)
Measuring departmental performance	149	69.8	2.309	(.885)
Measuring program performance	149	65.3	2.380	(.864)
Measuring performance against private sector counterparts	144	36.8	2.861	(1.042)
Measuring budgetary performance	149	53.7	2.517	(.997)
Improving economic management	150	64.7	2.380	(.895)
Improving compliance	149	48.3	2.670	(.768)
Improving accountability	148	49.3	2.891	(.883)
Achieving full cost recovery	145	40.7	2.752	(1.103)

[a] Lower mean scores indicate higher ratings of usefulness, (ie., 1='strongly agree'; 5='strongly disagree').

acknowledges the prime importance of liquidity factors in the separate disclosure of those asset classes 'which cannot be liquidated to meet liabilities or fund future activities' (see para. 48). Furthermore, solvency considerations (available cash reserves to meet commitments) are an important rationale provided by AAS 29 (para. 51) for requiring disclosure of a statement of cash flows. There are two possible reasons for the relatively low respondent ratings of 'liquidity' and 'solvency' evaluation. First, governments are usually assumed, and perhaps reasonably so, to be a going concern having potentially unlimited powers to raise revenue in times of financial crisis. Second, central government authorities normally incur and assume the liabilities of GDs. These issues potentially undermine the relevance of liquidity and solvency evaluations by external users in the public sector (Ma and Mathews, 1993).

The relatively low ratings of 'monitoring profitable position' by respondents could reflect the general absence of a profit motive in the operating objectives of GDs.

However, the requirements for GDs to disclose operating statements is justified by AAS 29 (see para. 44) ostensibly on the grounds that users need information about a GD's sources of revenues and costs, and how these amounts have changed during a period. This will reveal whether costs have been recovered from revenues, and whether revenues have in fact exceeded costs (profitable operations). Again, the survey results do not appear to confirm the usefulness of these disclosures for internal decision making purposes.

Other important decision contexts outlined by AAS 29, including 'accountability', 'monitoring cash flow' (para. 51), 'compliance' (para. 5) and 'budgetary performance measures', were also rated fairly modestly by respondents.

Nevertheless, certain decision contexts did attract moderate to high ratings by respondents. Indeed, Table 3 reveals that accrual accounting is particularly relevant to 'performance evaluation' factors, or at least factors which can impinge on performance evaluation assessments, such as 'evaluation of operating activities' and 'improving economic management'. Furthermore, the high ratings of 'monitoring financial position' are likely to have performance overtones when this variable is considered in the context of other items rated by subjects.[20]

For instance, the concept of financial position can be relevant to GDs in two broad contexts. The more common context, at least in the private sector, is from the standpoint of liquidity, which emphasizes the relevance of relationships between assets and liabilities. In this case, financial structure and capacity for adaptation are important features of financial position, as acknowledged by AAS 29 (para. 47–8). A second context for interpreting financial position (also acknowledged by AAS 29) is a GD's control over those resources available to meet operating objectives. However, respondents did not rate a liquidity focus of GPFRs very highly, suggesting that the second context of financial position, which more directly impinges on performance evaluation, is the more significant.

It is noteworthy that the relevance of 'performance evaluation' (in the context of the GD reporting environment) surfaced in other areas of the results. For example, while AAS 29 does not explicitly require reporting of non-financial performance indicators, approximately 79 per cent ($n = 163$) of respondents supported disclosure of these indicators to assist evaluation of efficiency and effectiveness in GDs. This result could suggest that subjects potentially consider non-financial sources of information as having equal, if not greater overall relevance than accrual accounting measures in the evalaution of a GD's activities and performance. This is an interesting question for future research.

Notwithstanding the fairly modest ratings of the relevance of accrual accounting to internal decision making, the results indicate that those GDs which were already preparing accrual-based financial reports (if only on a modified basis) tended to rate accrual accounting more highly across certain decision contexts.[20] To reiterate, this result also suggests the presence of an 'experience effect'. That is, GDs which already have experience in the preparation and use of accrual accounting appear more convinced about its relevance for economic decision making. Once again, this implies that attitudes to the relevance of accrual accounting could change once GDs have had a period of time to prepare and trial the information.[21]

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[20] The decison contexts included: evaluation of operating activities ($t = -4.82$, $p = .000$); monitoring cash flow position ($t = -3.30$, $p = .000$); monitoring financial position ($t = -4.82$, $p = .001$); improving accountability ($t = -3.68$, $p = .004$), and a number of performance evaluation factors.

Rationale 3

The provisions of AAS 29 can be readily implemented by GDs. That is, there are no major technical or other restrictions that can potentially inhibit AAS 29 from achieving its financial reporting objectives of providing relevant information to users

Concerns over implementation arise for at least two reasons. First, any major implementation problems are likely to impede the effectiveness of AAS 29 in fulfilling its financial reporting objectives. Second, some major concerns with accrual accounting in the academic literature relate to potential technical problems of implementation. Examples include: the complexity and cost of designing and installing new accounting systems (e.g., Brinkman and Brown, 1990; Churchill, 1992a); auditing verification issues (Kwon, 1989); problems with identifying and measuring public sector assets, particularly IH assets at market value (e.g., Pallot, 1990; Lewis, 1992; Mackintosh, 1992; McCrae and Aiken, 1994; Carnegie and Wolnizer, 1995); problems with applying economics-based definitions of assets, liabilities, revenues and expenses in the public sector (Mautz, 1981; Ma and Mathews, 1992b, 1993; McCrae and Aiken, 1994); problems of determining and measuring appropriate financial measures of output (and outcomes) to match financial input measures (examples include, Hepworth and Vass, 1984; Ma and Mathews, 1993).

Furthermore, some potential educational, cultural and political hurdles to accrual accounting include: the need to educate management and staff about the relevance and objectives of accrual accounting (Mackintosh, 1992; Churchill, 1992b); the relevance and acceptability of a 'private sector' efficiency-driven culture to the public sector (Ma and Mathews, 1992a, 1993); managerial and political factors relating to resistance to change and the 'management' of change itself (Paton, 1993; Wood, 1993; McGovern, 1993).

The present study attempts to draw together a range of potential obstacles to the introduction of accrual accounting and examine their relevance and applicability to the implementation of AAS 29. With respect to potential *technical* obstacles, the survey concentrated primarily on the *identification, definition* and *recognition* of several classes of assets, liabilities, revenues and expenses (henceforward ALRE). In purely technical terms, these issues represent the most critical aspect of converting from a cash to an accrual-based system of accounting (Sutcliffe *et al.*, 1991). However, the survey also explored broader implementation issues relating to education and culture.

Rationale 3: Survey Findings

The questionnaire requested respondents to rate their level of agreement as to whether there would be significant problems in applying the identification, definition and recognition criteria across a number of classes of ALRE requiring disclosure under AAS 29.[22] The results indicated that only 20–25 per cent of GDs expected to experience any major difficulties with applying either the identification and/or recognition criteria for ALRE required by AAS 29.

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[21] Further analysis also revealed this finding was not associated with the professional background or financial reporting experience of respondents.

For nearly all classes of ALRE requiring disclosure under AAS 29, respondents perceived that they would encounter relatively greater difficulty when applying the *definition* criteria of AAS 29 (which are the same definition criteria as SAC 4). These results are reported in Table 4.

Of interest is which particular classes of ALRE are likely to encounter relatively greater problems with AAS 29's definition criteria. To test this, a single-factor repeated ANOVA measure was used to compare respondent ratings of each class of ALRE. The omnibus F test was statistically significant [$F(3, 169) = 3.78$, $p = .012$]. *Post-hoc* testing (using paired t tests) indicates that respondents perceived the definition of *liabilities* to be the most troublesome problem of AAS 29. This was followed by (in order of importance): assets, expenses and revenues. Respondent concerns with the definition criteria of AAS 29 could suggest that some GDs are having difficulties in applying or relating the economics-based definitions of the conceptual framework, particularly liabilities and assets, to the public sector environment. This result is not surprising, considering that numerous listed companies have also encountered significant obstacles in applying the definition criteria of SAC 4 in recent years (see, Soh, 1993; Walker, 1993). If the private-sector experience is any guide, problems with applying definition criteria are likely to become even more exacerbated in the public-sector environment.

Furthermore, consistent with some academic literature, a significant majority of respondents agreed with questionnaire items that there would be a number of less 'tangible' problems confronting the implementation of AAS 29. The majority of respondents indicated that the most serious problems facing AAS 29 implementation would be (in order of importance): the need to train staff and management to operate an accrual accounting system; insufficient time provided by AAS 29 to implement the Standard; the issue of shifting government philosophy and culture more towards a 'private-sector' orientated culture; educating management about the objectives and technical provisions of AAS 29; and obtaining commitment to the underlying precepts of accrual accounting (e.g., from taxpayers, politicians). It is noteworthy that larger GDs appeared markedly more concerned with these potential educational and cultural problems than smaller GDs.[23] While technical issues are likely to present less of a hurdle to the implementation of AAS 29, a broad range of educational, cultural and political elements may still pose a considerable

[22] It is noted that the specific classes of ALRE listed in Table 4 do not describe all possible items relevant to these elements. They are intended to be representative rather than exhaustive of all possible debit and credit balances which can be potentially disclosed in the GPFRs of GDs.

[23] For instance, larger GDs (annual budget greater than $A300m) tended to rate the following education and cultural issues as more serious than medium and small size GDs ($A31–$A100 or $A0–$A30M respectively): educating management about the provisions of AAS 29 [$F(2,138) = 2.43$, $p = .04$), and educating management about the objectives of AAS 29 [$F(2,138) = 2.23$, $p = .01$]. These results could reflect the relatively greater degree of administrative intensity, bureaucratization and complex managerial structures which characterize larger organisations (Gordon and Miller, 1976, pp. 59–69; Emmanuel *et al.* 1991; Sharma and Jones, 1995).

TABLE 4

PROBLEMS IN APPLYING THE DEFINITION CRITERIA OF ASSETS, LIABILITIES, REVENUES AND EXPENSES AS PROPOSED BY AAS 29

Anticipated difficulties applying the definition criteria of AAS 29	Mean scores		Anticipated difficulties applying the definition criteria of AAS 29	Mean scores	
Assets	X[a]	SD	Liabilities	X	SD
Cash on hand and deposit accounts	3.365	(1.089)	Borrowings	3.345	(.975)
Receivables	3.264	(1.071)	Creditors	3.331	(1.046)
Consumable stores and supplies	3.268	(1.050)	Finance leases	3.272	(.976)
Office equipment	3.235	(1.049)	Long-service leave	3.248	(1.046)
Vehicles	3.275	(1.032)	Superannuation	3.174	(1.031)
Land and buildings	3.110	(1.018)	Wages and salaries payable	3.320	(1.060)
Infrastructure	2.776	(.949)	Others (e.g., accruals and trust funds)	3.000	(.577)
Heritage	2.814	(.943)			
Community	2.863	(.884)			
Investments	3.224	(.996)			
Others (e.g., inventories, prepayments, trust funds, and software licences)	3.083	(.669)			
Revenues	X-	SD	Expenses	X-	SD
Assumption of liabilities	3.097	(.967)	Buildings and infrastructure maintenance	3.160	(1.001)
Grants	3.320	(1.007)	Depreciation	3.101	(1.018)
Other contributions by donations and gifts	3.260	(.918)	Losses on disposal of non-current assets	3.128	(1.012)
Gains from restructuring of administrative arrangements	2.993	(.872)	Losses from restructuring on administrative arrangements	2.912	(.891)
Gains on sale of non-current assets	3.162	(1.024)	Rental expenses	3.399	(.981)
Capital appropriations	3.275	(1.026)	Services, utilities and operating leases expenses	3.318	(1.017)
Recurrent appropriations	3.322	(1.022)	Stationery or supplies used	3.342	(1.019)
Other appropriations	3.279	(.971)	Wages and salaries	3.376	(1.036)
Taxes	3.241	(.863)	Other employee entitlements	3.223	(1.022)
Transfers from other government departments	3.149	(.891)	Others (e.g., tangible expenses)	3.250	(1.258)
User charges	3.162	(.983)			
Others (e.g., sale of goods and services, and proceeds of fixed assets)	3.803	(1.084)			

[a] Lower mean scores indicate higher ratings of usefulness. (ie., 1='strongly agree'; 5='strongly disagree').

threat to the longer term success of the standard in achieving its financial reporting objectives (see also JCPA, Report 338, August 1995).

CONCLUSIONS

The introduction of AAS 29 has the potential to radically change the present cash-based system of accounting employed by the majority of Australian GDs. The issuance of the professional standard is indicative of the enthusiasm of the Australian professional accounting bodies to the relevance of accrual accounting in the public sector. However, beyond the immediate circle of the AARF and the accounting profession, there does not appear to be overwhelming support for the standard. Nowhere is this more apparent than in the academic literature. Many of these studies have demonstrated a variety of conceptual and pragmatic concerns associated with the introduction of accrual accounting in the public sector. Indeed, the underlying rationales and assumptions of AAS 29 constitute largely untested and unsubstantiated rhetoric of the conceptual framework.

The present study tested three important rationales of AAS 29. The findings suggest that most GDs do not support the issuance of AAS 29, and a significant minority of respondents indicated that they would not comply substantially with the requirements of the standard. On the other hand, the majority of respondents had no quarrel with many specific accrual accounting provisions of AAS 29. Lack of support for the standard appeared to be associated more with perceptions about the decision relevance of GPFRs and accrual financial reporting. The results indicate that while AAS 29 could be of benefit to certain users, respondents did not perceive GPFRs to be relevant to a wide range of users. Nor were many user groups expected to have common information needs which can be satisfied by the provision of GPFRs. Furthermore, the overall results suggest that the relevance of accrual accounting to the internal decision making of GDs was perceived to be fairly modest, notwithstanding that performance evaluation factors were rated fairly highly by subjects.

Certain aspects of the results show more promise for the future of AAS 29. In particular, the findings suggest that GDs which already employ full or modified accrual accounting systems consistently rated the potential external users of GPFRs, and the relevance of accrual accounting information to internal decision making, more highly than GDs who employ a predominantly cash basis of accounting. This result indicates that attitudes to the relevance of accrual accounting could become more favourable once GDs begin to prepare and trial GPFRs over a period of time. This is an issue warranting future research.

However, at this juncture in time, the substantial financial cost likely to be associated with implementation of AAS 29 (see Ma and Mathews, 1993) does not appear to be matched with compelling evidence of the claimed benefits of this standard.

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Editorial Report

Abacus is approaching its thirty-fourth year, and it is nearly ten years since it began its association with Blackwell Journals. During that time *Abacus* has maintained its strong international reputation with relatively stable subscription of around 1,000. This is a pleasing result as, worldwide, institutional subscriptions of most journals have been declining over this period. Interestingly, *Abacus* has approximately 800 overseas subscribers (the majority being institutional). This compares well with other leading international accounting journals, especially regarding the international scope of the readership. The spread of country membership is revealing: U.K., Eire, Iceland, Norway, Sweden, Finland, Denmark, Belgium, Netherlands, Germany, Switzerland, France, Spain, Italy, Greece, Poland, Czech Republic, Russia, Israel, Malta, Cyprus, Turkey, United Arab Emirates, Nigeria, Zimbabwe, South Africa, India, Sri Lanka, Malaysia, Brunei, Indonesia, Singapore, Thailand, Philippines, Hong Kong, Taiwan, North Korea, South Korea, Japan, Papua New Guinea, Fiji, Australia, New Zealand, Canada, U.S.A., Brazil, Argentina, Jamaica, Puerto Rico, Barbados.

Abacus also continues to attract half of its submissions from academics from many countries. The subject matter of those articles is varied and the research methods used remain eclectic. But the emphasis remains on papers that contain critical thought on an accounting matter of international importance. The acceptance rate of around 20 per cent (in line with previous years) is similar to that of many recognized international academic accounting journals.

The international reputation of the journal is reflected in the outcome of several peer reviews of the journal during 1994–96. For instance, in 1996 Professor Steven Zeff conducted an exhaustive survey of accounting academic journals (*Accounting Horizons*, 1996) which reported favourably on the performance of *Abacus*. In terms of international benchmarking, *Abacus* was ranked very favourably, being classified in the top ten of the leading international accounting journals. *Abacus* was the only Australian international accounting journal to be included in that list.

To remain strong and healthy the journal has relied, and continues to rely heavily, on its Editorial Board as well as drawing on the voluntary services of many *ad hoc* referees. By listing the names of those referees who have assisted in the journal's effective administration over the last three years, the board would like to publicly acknowledge their contribution. *Abacus* has also benefited from the professionalism and good-natured support of the copy editor Carl Harrison-Ford and the proofreader Mark Evans, the efficiency of Blackwell's editorial team and of course the ongoing financial support of the Accounting Foundation.

The board wishes to express its sadness at the loss of a leading Australian accounting academic and *Abacus* Editorial Board member, Peter Brownell, who died in March 1997. An obituary appears in this issue.

Graeme Dean

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ABACUS, Vol. 33, No. 2, 1997

Peter Brownell

Peter Brownell, Professor of Accounting at the University of Melbourne and a member of the Editorial Board of *Abacus*, passed away in Melbourne on 16 March this year, following a lengthy illness. Peter was aged forty-six. His loss is greatly felt in the international accounting community and especially among the members of the Australian academic accounting community, to whom Peter gave so much of his time and effort over the past fifteen years. Peter is survived by his wife, Julie, and two children, James and Sarah.

Following his BCom (Hons) at the University of Melbourne, Peter completed his doctorate at the University of California, Berkeley, before taking up a position on the accounting faculty at the Massachusetts Institute of Technology's Sloan School. Peter returned to Australia in 1982 and in 1984 was appointed Professor of Accounting at Macquarie University, before finally returning to Melbourne in 1991 as the Arthur Andersen Professor of Accounting. Peter gave an enormous amount of time to fostering the development of the accounting discipline within Australian universities. Apart from the many honours and doctoral students with whom he worked, Peter gave a great deal of time to the Accounting Association of Australia and New Zealand. From 1985 to 1990, he served as secretary, then president, followed by a five-year term as editor of *Accounting and Finance*, the AAANZ journal.

I am sure that those who knew Peter would agree that, despite his busy schedule and his dedication to his own program of research, Peter was always a willing helper who would offer advice and encouragement. As one who received much of that encouragement, I know that I shall greatly miss Peter Brownell, and I am sure that many other *Abacus* readers will feel the same.

Stephen Taylor
Professor of Accounting
The University of Sydney

ABACUS, Vol. 33, No. 2, 1997

MICHAEL GIBBINS AND ROGER J. WILLETT

New Light on Accrual, Aggregation and Allocation, Using an Axiomatic Analysis of Accounting Numbers' Fundamental and Statistical Character

The general nature of basic accounting measurement procedures is analysed from the perspective of their representational faithfulness rather than, as is normally nowadays done, from the perspective of relevance to user decision models. The character of accounting numbers is examined using an axiomatic framework based in statistical theory to demonstrate that statistical properties of the numbers are created by the process of preparing, constructing, the numbers. These properties, deriving from the process of constructing the numbers, are there regardless of the uses to which the numbers may be put, and therefore knowledge of them informs not only preparers of the numbers but also those who decide whether and how to disclose them to others, and those who make use of them for any purpose.

The article argues, with axiomatic analysis and examples, that accounting numbers are statistics having properties such as distribution and variance that affect their usefulness in general and that may be examined separately from any use. Such an examination is helpful partly because it then avoids confounding the understanding of accounting measures' technical nature with issues of disclosure choice and use. The necessary axiomatic framework is presented briefly to establish its perspective on measurement questions, then the value of the framework for examining vexing accounting issues is illustrated with examinations of accrual accounting and matching, cross-sectional and time-series allocation, and accounting-relevant market values.

Key words: Accrual basis accounting; Aggregations; Theory; Statistics.

MICHAEL GIBBINS is Winspear Professor of Professional Accounting, Department of Accounting and Management Information Systems, University of Alberta, and ROGER J. WILLETT is Professor of Accountancy, Deparment of Accountancy, University of Otago.

INTRODUCTION

Most recent discussion of the general, as opposed to specific, nature of the information provided by accountants has dwelt upon the issue as seen from the perspective of users' needs. 'Relevance to a decision' rather than 'representational faithfulness' has been the criterion on which the claim for the general usefulness of accounting information has been based (e.g., FASB, 1978; Sterling, 1979). This article refocuses this question upon representational faithfulness. In doing this it follows in the tradition, now mostly overlooked in the accounting literature, originally established by Ijiri (1965), Chambers (1966) and others (e.g., Vickrey, 1972; McKeown, 1972) in asking and answering the question 'What do the accounting numbers constructed by accountants and reported in financial statements actually represent to us about the wealth-creating activities of firms?' Basically, it is shown how the fundamental measurements made by accountants are an essential component in virtually any system of financial reporting whether this is historical cost accounting, its many modified forms, or systems of cash flow and the many types of current value accounting.

The accounting quantities such as income that are disclosed to and used by decision-makers are derived from an underlying data generation system that defines the statistical character of the resulting data. That character, which reflects both socially derived and fundamental measurement features, influences the nature of accounting's quantities and therefore their value in economic decisions, performance evaluation and other uses. This article presents an inquiry into the statistical character of accounting numbers, revealing features that are important to understanding what the properties of accrual accounting numbers are and drawing implications for empirical research, practitioner judgment and standard-setting.

This article integrates and extends a variety of prior axiomatic and related studies. The focus is on the character of accrual accounting numbers, and the objectives are several:

1. To provide a rigorous depiction of the generation of accounting numbers from economic transactions, a depiction that depends on the character of the data generation system and is separated from the forces that may influence disclosure and use of derived quantities. The analysis does not deny the importance of such forces but rather clarifies what accounting numbers are about, in the expectation that this will assist in understanding their value in disclosure and use.
2. To make all parts of this depiction explicit, thereby improving the understanding of accounting numbers. Some parts reflect social-choice features doubtless related to the uses people expect to make of the numbers, such as the transactional base of accounting and the focus on debt-contracting arrangements among economic actors. Others reflect fundamental measurement principles, such as the additivity of costs (transaction prices) and the matching of expenses and revenues by means of production relations. Still others reflect the stochastic nature of accounting quantities and lead to the conclusion that many accounting numbers, for example, earnings and market values, may usefully be interpreted

as special types of statistics.

3. To provide perspectives on, and insights into, problems that continue to challenge preparers and users of accounting numbers, in particular the stabilizing effect of accrual accounting, the matching process, and both aggregation (adding accounting numbers together) and allocation (dividing them up). However, no empirical data is presented since the article is directed at theoretical, statistical issues such as the nature of accrual numbers, to clarify how such issues might be understood.

The analysis employs a theoretical framework suitable to these objectives, which is called here 'statistical activity cost theory', or SACT. This framework is used as a vehicle to facilitate the analysis, not as an end in itself. However, it is based on a carefully chosen set of measurement axioms, so, consistent with the argument that accounting numbers' fundamental features inform their use, the basic features of SACT are explained in order to clarify the subsequent applications.

This article proceeds in several sections. The first section sets out the perspective on measurement used in the analytical SACT framework and in the process clarifies the way disclosure and use of accounting information relate to the framework. The next section summarizes the axiomatic structure of the analysis. Necessary details are presented in tables, figures and an appendix, so that the central features of the structure may be emphasized in the narrative. The following three sections contain short analyses of accrual accounting and matching, cross-sectional and time-series allocation, and market-value aggregation using the framework. These sections illustrate the framework's application, but importantly also illustrate the kinds of questions the framework raises about accounting information. The last section contains brief conclusions.

PERSPECTIVES ON MEASUREMENT, DISCLOSURE AND USE

As is true for any measurement system the outputs of which are to be used by people, the identity of the measurements recorded by accountants is ultimately shaped by the demands of users and the contexts in which they use accounting information (Feltham, 1973; Mock, 1976; Vickrey, 1985; Demski and Sappington, 1990). The statistical character of accounting numbers is shaped by the procedures accountants (preparers) follow in generating their fundamental measures and deriving accounting quantities such as earnings from them. To the extent that preparers' motivations differ from those of users, the statistical character of accounting quantities may not be entirely congruent with the users' needs (Demski, 1973; Feltham, 1973). Accounting information (the quantities generated by preparers) is received by the users only if it is disclosed, so the disclosure function provides a second modifier of the nature of the accounting numbers as users receive them (Verrecchia, 1983; Gibbins *et al.*, 1990, 1992). Thus, an accounting system entails several hierarchical modifiers of the connection between economic events and the quantities released to the users: fundamental measures; the derivation of various accounting quantities from the measures; and the disclosure of derived quantities. Figure 1 illustrates this hierarchy.

FIGURE 1

HIERARCHY OF FUNDAMENTAL MEASUREMENTS AND DERIVED QUANTITIES IN THE DEMAND FOR AND SUPPLY OF ACCOUNTING NUMBERS

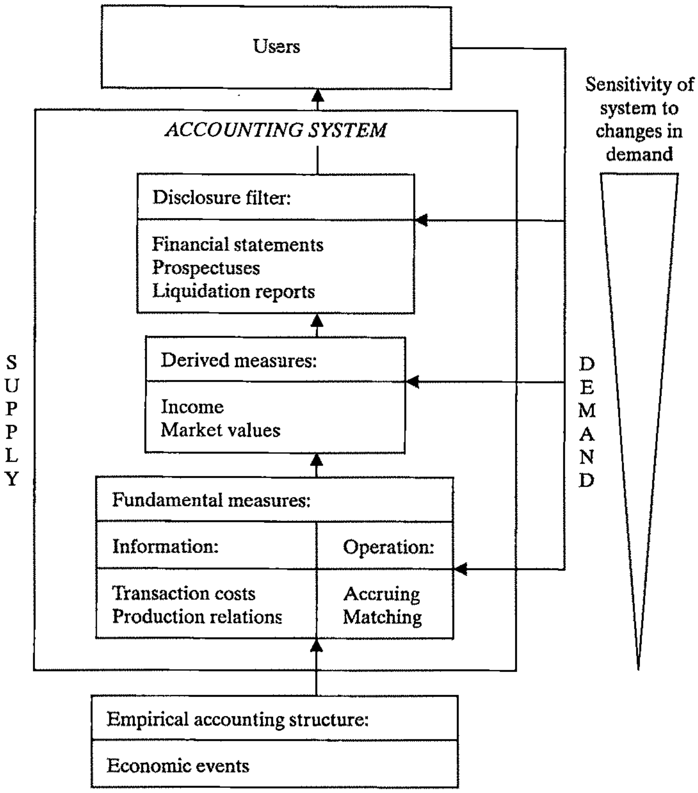

Figure 1 illustrates several other things. One is that the whole accounting measurement edifice is built on an underlying set of events that the system tracks. The underlying set of events (the 'empirical accounting structure') is the slice of events in the world to which accounting is directed and to which accounting presumably should be *representationally faithful.* Another is that the sensitivity of the supply of accounting information to its demand diminishes as one moves further down the figure. User demand impacts relatively rapidly on disclosure regulations, especially where this requires information already available. It impacts less readily on the production of derived measures. For example, the demand for alternatives to accounting earnings is less readily supplied than are, say, additional facts about financing leases. At the fundamental measurement level, procedures are rarely subject to changes in demand such as would be involved, for instance, in a switch from contract-based to order-based accounting. The triangular wedge shape in the figure indicates this diminishing susceptibility to change within accounting systems. Finally, the figure also illustrates the focus of this article in exploring the nature of accounting's information. Attention is initially directed towards the fundamental measurement characteristics and later to illustrative derived accounting quantities. Questions concerning the appropriateness of disclosure practices which are extensively debated elsewhere (e.g., in the agency theory and behavioural literature) are not addressed here.

Figure 1 thus portrays the contention that accounting *measurement* issues can usefully be examined separately from issues of *disclosure* and *use* of the accounting quantities derived from the measures. Disclosure and use certainly must be considered if the *relevance* (e.g., to economic decisions) of accounting is to be examined, and strategic questions about users' needs and preparers' willingness to disclose certainly lie behind the overall accounting structure (e.g., Sterling, 1987). But given that, the question of how accounting's measures relate to underlying empirical phenomena, such as their *representational faithfulness*, can be examined quite extensively if separated from the issues higher up the Figure 1 hierarchy. The analysis used will demonstrate this point, which is not a new one (e.g., Willett, 1987; Balzer and Mattessich, 1991) but, when followed carefully through the operations that are conducted to produce accounting measures and derived quantities, it provides a substantive analysis which can then inform the disclosure and use domains. Whether users recognize it, for example, the fundamental process of recognizing transactions and assigning to them numbers (called *activity costs* below and forming the common basis for the derivation of accounting numbers) creates quantities having statistical and other characteristics that both enable and limit their use.

Arguments are presented to some extent as a counterbalance to the views sometimes expressed in the accounting literature that fundamental characteristics such as representational faithfulness do not matter and that the sole test of accounting's quantities is whether they help decision-makers, such as in matters of prediction or control (e.g., see Butterworth *et al.*, 1982). In this view, decision-makers may choose one quantity rather than another because it correlates better with outcomes perceived to be important. While this view is valid as far as it goes, there is more to the story. For example, users must be confident that they understand what a measurement *represents* before they can form a rational judgment on its use in a decision model. Furthermore, the statistical nature of two numbers, say A and B, are functions of the way they are generated, and it may be that adjusting the generation process can convert A to B, or produce a C that has more attractive characteristics than either. Comments below on accrual versus cash measurement demonstrate that the correlation or covariance of measures can be informative in choosing between them.

A related issue is the measurement status of the historical (or 'actual') cost system and the extent to which it provides useful information signals for decisions. This has recently been discussed by Vickrey (1994) in the context of the theories of Beaver and Demski (1979), Beaver (1981), Demski and Sappington (1990), Vickrey (1992) and Ohlson (1987). It also plays a part in Penman's call for a return to fundamentals in accounting research (Penman, 1992). In view of the importance of these theories in keeping the central concepts of measurement and valuation alive in the accounting literature (see also Ohlson, 1995; Feltham and Ohlson, 1995), it is worth emphasizing that our approach is based upon underlying accounting practices as fundamental measurements of what are termed activity costs leading to the derivation of calculations of economic values and thence to an understanding of accounting numbers as statistics with certain distributional properties which can provide information to decision-makers. Thus, while offering an alternative approach to understanding accounting measurement practices (e.g., it is transaction cost and profit-and-loss account oriented rather than directly valuation or balance-sheet oriented) this article seeks to achieve similar ends to those sought in the literature just cited (i.e., it attempts to reconcile the measurement-valuation and information-economic perspectives).

Four main points summarize the argument regarding issues of measurement, disclosure and use:

1. Accounting measures and derived quantities, like other number sequences, have various statistical characteristics that exist independently of their use in decisions but that can be useful in such decisions. To draw an analogy from elementary statistical theory, for instance, the properties of the arithmetic mean, described by application of the central-limit theorem, exist independently of any loss function which might be used to assess its efficiency as an estimator. An important part of the argument here is that accounting numbers *are* statistics and that charting their basic properties can sometimes assist in understanding and developing them for multiple uses. If the sampling distribution of an accounting number happens to be skewed about the mean, for example, this might affect the confidence with which it would be used in a prediction.
2. A precise understanding of the source of the accounting quantities used in financial statements is essential in investigating the statistical characteristics of accounting numbers. For example, knowing the degree to which systematic measurement practices create 'biases' in accounting numbers would enable a decision-maker to adjust responses to counter those biases for purposes of estimation and prediction. Depreciation is an instance of a calculation that has the potential to reduce the variance of earnings as an estimator of income. A statistical analysis of such common adjustments is overdue and, following the arguments presented here, would be informative to debates about the value of accounting information in disclosure and use contexts.
3. Separating the fundamental production of accounting numbers from assumptions about rational decision-making or market structures allows a technical examination of accounting measures that can more clearly inform debates about accounting's value than if that examination were confounded with use issues. In saying this, it is emphasized that this does not mean ignoring use issues, rather, it implies the need to separate them for analysis. Economic value approaches to accounting numbers (e.g., Hicks, 1946; Edwards & Bell, 1961) tend to mix the characteristics of use with the characteristics of generation, but because

of different forces at the two levels and, perhaps, stickiness in the response of the measurement system to demand changes (Figure 1), the two sets of characteristics are not the same.

4. The focus on number-generation aspects of accounting measurement provides insights that should be useful to the preparers of the information and to standard-setters concerned about the preparation process, because any response to changes in demand by preparers requires changes in disclosure and measurement processes along the lines suggested earlier in the context of Figure 1. Adjusting the measurement process for changes in demand is a complex task requiring deep knowledge of how the process works. As indicated by the FASB's conceptual framework project (e.g., FASB, 1980a, 1980b), an important point of this task is the necessity to guide preparers by establishing what financial statements are used for (e.g., AICPA, 1973; FASB, 1978). This article endeavours to show that another important part of this task, overlooked in more recent research, is the need to establish the statistical implications of accounting policy choice where this involves pronouncements on accounting measurement. This understanding has the potential to make a significant contribution to recent requests for academic help by practitioners and standard-setters struggling with changing demands (e.g., Beresford, 1991; Ernst & Young, 1993).

THE AXIOMATIC FRAMEWORK FOR THE ANALYSIS

The following analysis rests on a consistent method of converting observations about economic activities into accounting measures and deriving accounting quantities from the measures. Following from Figure 1, both the lower level conversions (production of fundamental accounting measurements) and the higher level derived quantities that are submitted to the disclosure decision are contemplated. Fundamental measures are 'lower' in that they usually result from direct assignment of numerical values to the observations of the underlying empirical structure, whereas derived quantities are produced by further calculation and their relationship to underlying phenomena is therefore only indirect (see Krantz *et al.*, 1971). In the context of accounting, the characteristics of direct measures relate, or should relate, to the relatively 'objective' elements of the underlying phenomena of interest (e.g., the debt value shown on an invoice) whereas indirect measures, such as annual earnings, appear to be more 'subjective'. They are more removed from the phenomena and take on statistical properties that are related to the method of their derivation. In accounting, unlike the natural sciences, there are relatively few derived measures which have significance derived from empirical 'laws' which relate fundamental measures together in a systematic manner (e.g., as in the case of the measurement of density). Most important derived measures in accounting are important because of their potential to act as estimators of decision parameters valued by users. These issues, and the axiomatic analytical framework linking them, are examined in this section to provide a sound, logical basis for the later analysis of accruals, matching, allocations and market values.

Transactions, Costs and Fundamental Accounting Measures

Our analysis is based on two structures describing the accounting measurement of economic phenomena, one concerning the debt (exchange cost or price) created by transactions in monetary economies and the other concerning input–output relations in production processes. Together, the *cost structure* and the *production structure* provide a database of *activity cost* measures for use in deriving accounting quantities. Both represent measurable, real-world phenomena but, especially in the case of the former, accounting numbers reflect the results of observing outcomes from accepted economic and legal relationships. Accurate accounting measurement is therefore ultimately a question of faithfully representing both social and technological relationships.[1] The phenomena, whether social or technological, are real, and in our formulation representational faithfulness is defined through the rules used to produce the fundamental measures. This analysis extends work by Mattessich (1957, 1964) on exchanges and Ijiri (1965, 1967) on production processes with a general debt to Littleton (1953). Mattessich's work is important for its identification of debt as a fundamental measurable variable in accounting, while Ijiri's early theories attempted explicitly to model the accountant's matching of revenues and expenses. In presenting the transactions approach to understanding accounting measures, Littleton showed it to be crucial to understanding accounting's descriptive validity. Vickrey's (1972) formulation of the problems of accounting in a measurement theoretic context and Tippett's (1978) effort to generalize the historical cost framework to other types of accounting system have been drawn upon.

In the framework developed here, transaction costs and production relations are observed separately and the latter are used to 'match' the former into 'activity costs' which become the basis for all the subsequent analysis, that is, all accounting numbers are constructed as some function of collections of activity costs. The precise definitions and axioms on which our analysis is based are listed in Tables 1 and 2. Table 1 describes the well-defined sets representing exchanges between and production by accounting entities upon which the axiomatic framework is based. Table 2 states the axioms that are used in the construction of the measures, the most basic constructed notion being that of separable additive activity costs incorporating the essential features of production and exchange.

Briefly, there is an *accounting structure* <C, +, z->> that combines the cost and production structure elements, using transactions, production transformations and matching to provide the *activity cost representation theorem*, that is, that a firm's financial state can be represented as a set of additive, dated activity costs.[2] Figure 2

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[1] All measurement procedures are, of course, ultimately human, social constructs.

[2] The sense in which activity costs are additive in the 'fundamental' measurement theoretic sense of the word, the proof of the associated representation theorem and the related uniqueness theorem are explained in detail in Willett (1987; 1988) and more formally in Willett (1991a). The notion of 'derived' measurements used in this paper is that they are simply some function of fundamental measures. This usage follows Roberts (1979, p. 77) and is an extension of that used in Krantz *et al.* (1971) where there is an implied restriction of the term 'derived measurements' to calculations which reflect empirical laws. It is easier to discuss statistics (and in particular accounting numbers as statistics) in the context of measurement theory if the more permissive and flexible approach of Roberts is adopted.

TABLE 1

SETS, RELATIONS AND DEFINITIONS FUNDAMENTAL TO THE ANALYSIS[a]

(a) *A finite set of accounting individuals X.* The individuals of this set are the smallest elements in the system capable of entering into debt (exchange) relationships. In our social system, these may be physical individuals or legal persons such as corporations or agencies. Subsets of this set are *accounting entities*, denoted by subscripts, such as x_i, x_j, x_k. A transaction (exchange) involves two entities.

(b) *A fine set of resource elements A.* This is the set of resources transferred (exchanged) between entities by transactions, indexed subsets of which are a_i. Resources include physical things, agreements, shares or anything in respect of which a debt (an exchange) can be incurred. If a debt has been incurred, there has to have been a transaction. The resource set includes *synergy elements* representing the possibility of transferring resources (the proper elements of A) together, in different combinations, rather than separately.

(c) *Time intervals, w.* This is a finite set of half open intervals of which the endpoints are points in time. The end points are as close together in time as necessary for practical purposes, and accounting periods are combinations of disjoint, adjacent elements of w.

(d) Transaction costs. Let X_i, X_j and A be the power set of X and A, respectively. Then a transaction cost (cost, for short) c_i is defined as an element of the product set X_i x X_j x A x W, so that $c_i=(x_i, x_j, a_i, w_i)$. c_i represents the debt exchange (the relation between two entities represented by x_i and x_j) arising from the transaction involving a_i during the interval w_i. The four sets on the right are the components of c_i necessary and sufficient to identify all costs resulting from exchanges (each exchange being ‘negative’ for one party, a revenue, and ‘positive’ for the other, an expense). Transaction costs require an exchange, so other kinds of ‘costs’ in accrual accounting, such as depreciation, are not yet defined.

(e) *Cost pairs form the set of all transactions costs.* A pair of costs of equal value but opposite sign is generated by every transaction, for example, (x_i, x_j, a_i, w_i) and (x_j, x_i, a_i, w_i). Each is the ‘dual’ of the other. x_i and x_j the two accounting entities may both record these costs, reversing the sign in each case. Not all costs are additive. Those that are additive are members of the set K. This is defined as the set of all transaction costs consisting of those pairs of costs in which exactly one of the components in each cost is entirely disjoint while the others are identical or in which the entity components are reversed while the other components are identical.

(f) *Production relations and matching*. These calculations enable effect to be given to Paton and Littleton’s notion that ‘costs pass in production’ (Paton and Littleton, 1940). A *production relation,* denoted z–>, over the dated resource set AxT indicates a physical cause and effect relationship between the resource set a_i at time t_i and a_j at the next earliest discernible point in time t_j written $(a_j t_i)$ z–> $(a_i t_j)$. If the production relation (a_i, t_i) z–> (a_i, t_j) exists the resources a_i and a_j are said to be *active* at t_i and t_j respectively indicating that some entity z holds a_i at time t_i and holds a_j at t_j after transforming a_i to a_j. Production relations partition costs into equivalence classes of separable activities allowing the construction of *activity costs* by the addition of the transaction costs associated with each resource set in the activity. Resource sets are physically connected to each other by the production relation and this is used to ‘match’ resource sets which are part of the same production sequence. Costs are assigned to these resource sets independently of any technological, physical considerations by reference to debt values assigned to transactions.[b]

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[a] More detailed explanations of the terms in this table are given in Willett (1991a).

[b] The assignment is typically a statistical association rather than a definite association in practice.

TABLE 2

AXIOMS FUNDAMENTAL TO THE ANALYSIS

<C,+,z->> is an accounting structure if and only if for all values of the relevant variables the following axioms hold:

Axiom 1: Additivity of costs. A function c: $C \rightarrow R$ exists such that,

$$c(c_i \cup c_j) = c(c_i) + c(c_j) \text{ iff } c_i, c_j \in K$$

This axiom provides a cost measure that is additive under the conditions stated. Additivity is a property assumed in practice and recognized as useful in measurement theoretic contexts (see Vickrey, 1972). This theory assumes only the existence of some extensive measurement process which entities can use to scale their debt relations with other entities.

Axiom 2: Production flow. If (a_i,t_i) z->(a_j,t_j) then $t_j=t_i+\Delta t$. This axiom states that production processes only move forward in time, where Δt is a just noticeable time interval.

Axiom 3: Continuity of production. If a_i is active at t_i and t_j such that $t_i<t_j$ then (a_i,t_i) z-> $(a_i,t_i+\Delta t)$. Recursively this axiom guarantees the existence of a sequence of production relations (prs) between the same resource set over time. Effectively it denotes continuity of possession over time.

Axiom 4: Separability. If a pr is separable into a smaller pr(1) then the pr is also separable into pr(2), where pr=pr(1) ∪ pr(2). Together with axiom 5, this axiom has the effect of allowing the disaggregation of prs down to the level of minimum resource elements.

Axiom 5: Jointness. If a pr is not separable it is joint. This axiom maintains that prs are either separable or joint. It implies a definition of jointness in production sequences as those consisting of resource sets which it is not possible to break down in the way described in axiom 4.

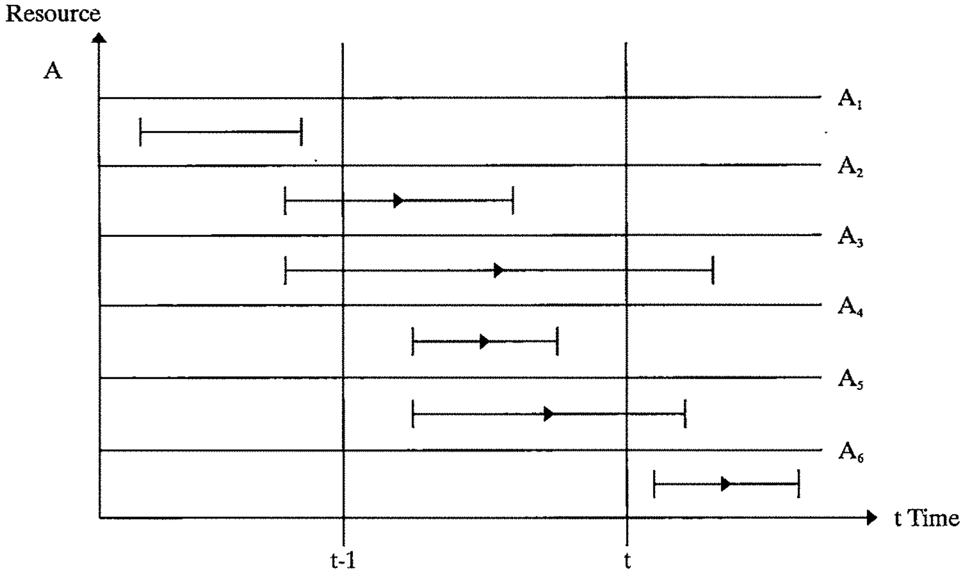
Axiom 6: Consistency. Let $c(a(k),w_k)$ be the cost of the resource element a(k) in w_k. If a(k) is inactive in w_k then c(a(k), wk) is null and conversely if $c(a(k),w_k)$ is debited or credited then a(k) is active at some point in w_k. This axiom states that when positive or negative debt is created some production relation must be involved.

Note. Axiom 1 can be replaced by a number of purely qualitative cost axioms in the manner strictly required in measurement theory (see Willett, 1991a).

schematically illustrates the main measurable features of the resulting accounting database. Therein, resource sets entering the different activities should be thought of as being conveniently placed along the ordinate. Over time, measured on the abscissa, these resources are matched by their relationship in production and the costs associated with each resource set can be envisaged as a financial intensity factor measured on a third axis rising out of the page. The boundaries to the activities are such that no physical production relations cross them. Each activity has associated with it a start time and a duration time indicated in Figure 2 by the arrowed lines. With respect to the accounting period t-1 to t there are six different possible patterns of start and duration times, each of which has significance in accounting calculations. These are shown as individual cases. For example, in the case of A_2, the activity started (e.g., by purchasing the first input) before the beginning of the accounting period and ended during the accounting period. If the activity was short-term (such as when an item is purchased or transformed for resale) the aggregate cost at t-1 would be carried forward and 'recognized', forming part of

FIGURE 2

THE ACTIVITY COST REPRESENTATION OF A FIRM SHOWING THE SIX BASIC ACTIVITY STATES USED IN THE CONSTRUCTION OF ACCOUNTING NUMBERS



the earnings measure, only at t.[3] In contrast, the costs incurred in activity A_3 would be ignored in computing earnings at both t-1 and t if A_3 was a short-term activity or, alternatively, entered as depreciation in the case of a long-term activity (such as would normally be the case if A_3 involved holding or using an item of machinery).[4] Under this approach to modelling accounting concepts, *assets* are defined as unfinished activities, acquired by (purchase) exchanges and production, and *equities* are finished activities, resulting from (sale) exchanges.

Stochastic Processes and Derived Accounting Quantities

It is fundamental to our analysis that the attachment of monetary values to the economic events of exchange and production is stochastic. The underlying events have a physical existence, but they are the outcomes of probabilistic economic processes; in turn, accounting calculations reported in financial statements and management reports are functions of random variables defined on activity costs (i.e., events) in the accounting sample space generated by the firm's activity. A firm's success and survival depend upon how lucky or clever management is in sampling events from its *accounting space* over time. More specifically, an accounting number (derived quantity, in our usage) can be described as a function of the following type:

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[3] The analysis in this paper does not attempt to investigate the statistical consequences of adjustments such as the 'lower cost and market rule' or those arising from more thoroughgoing amendments to conventional practice such as 'deprival value' accounting.

[4] The rules are illustrated comprehensively and formally in Willett (1991b).

$$\alpha(t) = f(C(t), S(t), D(t), h_i), i = 1 \text{ to } n \qquad (1)$$

Here C(t), S(t) and D(t) are random variables whose probability distributions depend on t. The values of C(t) are interpreted as costs (positive or negative as noted in Table 1) accumulated in economic activities up to t; the values of S(t) are the start time for such activities; and the values of D(t) are duration times.[5] The h's form a list of n decision variables which may be included in accounting calculations to provide a derived quantity for some decision-making or statistical purpose, such as deriving depreciation from underlying cost records by including the estimated useful life and salvage value of an asset. The values of S(t) and D(t) are measured by ordinary time measurement, and the framework's axiomatic structure justifies C(t) as an additive measure over activity costs. Two examples of the application of this approach to modelling accounting quantities, which will be discussed in more detail below, are given in Table 3.

Because, using the SACT framework, it is possible to model accounting quantities in terms of the underlying database variables plus specified decision variables (h), the effect of the underlying economic and physical environment of the firm on the statistical behaviour of the quantities, once disclosed, may be investigated. Formally, this involves interpreting accounting numbers as sample data drawn from the accounting space. This is consistent with the view of accounting numbers as being naturally interpretable as statistics and provides the basis for a modelling procedure through which the sampling distributions of accounting numbers may be derived (Brief and Owen, 1970; Albrecht, 1975; Brief, 1989). Such statistics may then be used for any number of different purposes. For example, the estimation of neo-classical economic variables suggested by economic theory as being important or for their correlation with stock-market phenomena (Penman, 1992; Ohlson, 1995). Nevertheless accounting statistics are generated by the particular transaction and matching operations described above and so are not necessarily proxies for the variables specified by other theories.

Concluding Observations about the SACT Analysis Framework

The basis of our analysis of accrual accounting and other topics below is the accounting structure as defined axiomatically. The analysis flows from the specified transactional sets and production relations. This structure is consistent with early axiomatic accounting measurement work (e.g., Mattessich, 1957, 1964; Ijiri, 1965;

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[5] Broadly speaking these three central variables which define activity costs reflect the effect of the basic economic forces of demand and supply on accounting entities.

TABLE 3
TWO EXAMPLES OF THE APPLICATION OF THE SACT APPROACH TO MODELLING

Example 1. Historic cost accumulated profit at t(H(t)).

$$H(t)=\sum_{i=1}^{i=N(t)}\{C_i(t) + [f_i(t-S_i(t)) - C_i(t)]\, I_{(Di(t)>t-Si(t))}\} \qquad (1)$$

Here, the random variables are as defined in the text, the subscript denoting the ith activity. N(t) is the number of activities started prior to t, $f_i(t-S_i(t))$ is a depreciation function depending upon elapsed activity time and $I_{(Di(t)>t-Si(t))}$ is an indicator function taking the value I when the ith activity is unfinished at t and 0 otherwise.

If the depreciation function is always zero and start and duration times are measured from settlement dates (1) is the accumulated cash flow from operations. From a statistical point of view a useful property of accounting numbers of this type is that for sets of activities forming a project with definite start and finish times, difference measurements defined on (1) as:

$$dH(t)=H(t)-H(t-1) \qquad (2)$$

all have a common expected value when averaged over time. Since most conventional accounting income measures *are* defined as in (2), this suggests an obvious statistical criterion for comparing them (i.e., minimum variance). Specific forms of (1) can yield interesting results, discussed below (see 'Allocations').

Example 2. The market value μ(A,t–1,t) of an asset A at t based on the accounting period [t–1,t) is defined in terms of the expected value of the transaction costs of A as follows:

$$\mu(A,t-1,t)=E[C|A,t-1,t] \qquad (3)$$

where E[C|A,t–1,t] is the conditional expectation of the costs of A in the period t–1 to t.

From this definition and by taking into account the 'goodwill' resulting from recognizing the costs of the improper 'synergy' elements included in the resource set it is possibly to justify the additivity of market values. This point is elaborated in the section, 'Market Values'. Typically in economic analysis which relies upon a non-transactional understanding of accounting measurement the additivity of market values is assumed but cannot be justified without highly unrealistic conditions of perfect competition and complete markets being imposed (e.g. Beaver, 1981).

and see summaries in Vickrey, 1975; Mattessich & Willett, 1994), as well as recent work by Deguchi and Nakarno (1986), Nehmer (1988) and Balzer and Mattessich (1991). The approach is, however, strictly measurement theoretic (see Willett, 1991a, for details) and as such stands in contrast to (though is probably entirely consistent with the results of) Lim's (1966) description of an abstract mathematical accounting structure and Carlson and Lamb's (1981) formulation of accounting measurement and disclosure on the basis of first-order predicate logic.

SACT, the analytic framework used here, has several distinctive features that are important to the way derived accounting quantities are viewed in our analysis:

1. The activity cost database consists of separable and additive measures that represent economic events (exchanges and production). The economic events, that is, the resources exchanged and the production inputs and outputs, have a physical existence separately from their being assigned monetary values. By axioms 4 and 5 (Table 2), these can be disaggregated and then recombined for any

decision purpose whatsoever. The analytical framework thus allows the separate measurement of different kinds of economic activity but does not constrain the manner in which accounting data might be used for decision-making purposes. For example, by restricting the entity sets over which values of costs are summed and defining current values in terms of expected costs, either entry or exit market values can be produced instead of the usual historical values (see Hodgson *et al.*, 1993, and 'Market Values' below).

2. Justification of the representation of a firm (or, in the limit, an economy) as an additive collection of separable activity costs by virtue of the activity cost representation theorem depends upon the accountant's matching concept. Any costs incurred in production over a given dated interval are matched via production relations and their sum defines a dated activity cost and that cost is the basic modelling variable of the framework. The matching relation is reflexive, symmetric, and via continuity axiom 3 (Table 2), transitive, partitioning the total resource set and providing pairwise additivity of activity costs aggregated across the accounting entity's customers and suppliers.
3. SACT, as its use of 'statistical' and 'activity cost' indicates, models accounting quantities as realizations from underlying statistical distributions of costs, conditioned by decision variables used to derive the quantities from the underlying activity cost database. The accounting space includes all possible values of all possible partitionings of the cost set based upon the matching relations in production, allowing the modelling of both actual and potential activities (e.g., market values reflecting exchanges that have not happened). In this view, accounting measures and derived quantities are fundamentally statistical and have statistical attributes separate from those that might be induced by disclosure decisions or use (e.g., prediction, or correlation with stock prices).
4. Given the activity cost representation theorem above and assuming that the measured accounting quantities are disclosed, the major financial accounting accounts and identities illustrated in Figure 3 may be defined and validated. In the figure, assets at any time, t, are, as previously defined, unfinished costs at that time under the transactions (exchange) notion behind our framework. Retained realised profits are equities at time t, that is, the costs (positive or negative) contained in finished activities to that time. *Funds* are the sum of assets and equities. *Financial accounts* are the complete set of costs in the history of the accounting entity up to its balance-sheet date, and *financial statements* are any transformation of financial accounts that preserves their arithmetical identities. Figure 3 illustrates these accounts and identities; the details of their derivation and some basic matters relating to the properties of financial statements are set out in the Appendix.

We now turn to an analysis of accrual accounting, allocations and aggregation issues using the SACT framework. In the formal development of the theory so far, attention has been focused on describing accounting data as the outcome of *actual* transactions. Reliance on actual transactions data, however, would severely limit the applicability of the theoretical structure pictured in Figures 1 through 3 to real-world situations. Accounting quantities are often based on either non-transactional or nonfirm-specific information. The kind of information necessary to justify the allocation of actual transaction costs to activities (e.g., when valuing inventories) is often absent from the details of ordinary transactions Even in the case of physically separate processes this may arise due to the imperfection and incompleteness of markets. These factors lead to the existence of bulk-buying discounts, goodwill payments, composite costs and sometimes to the complete absence of transactions data. In such circumstances, accountants resort to various 'estimating' techniques such as average costing, FIFO and LIFO which appear to be arbitrary when interpreted in the light of traditional neo-classical economic theories of income measurement. Similarly the accounting practice of spreading the costs of fixed assets over several accounting periods appears mysterious if the resulting depreciation calculations are interpreted as a direct measurement of resource usage (Thomas, 1969). These issues, together with the related topic of the sense in which market values are additive, will be discussed in the illustrative analyses below.

The examples in the following sections frequently consider long-run income (profit) as the performance measure of interest. This is done because of income's importance in accounting practice, theory and research and because much of the controversy over the characteristics of accounting measures, such as their smoothing properties, has examined income. However, all of this illustrates the value of our general theoretical framework in analysing accounting numbers, rather than promoting the view that income measures *should* necessarily be of central concern. The illustrations could be redone with any other chosen accounting quantity (parameter). The general points to be made, for example, about the importance of knowing the covariance structure between key accounting variables, apply to any

FIGURE 3

THE ACCOUNTING IDENTITIES

	Balance Sheet identity at t–1		Source and application of funds		Balance sheet at t
Capital maintenance	Opening equities	+	Retained profits in period	=	Closing equities
	+		+		+
Changes in assets	Opening assets	+	Changes in assets	=	Closing assets
	=		=		=
Changes in funds	Opening funds	+	Changes in funds	=	Closing funds

derived accounting quantity. The actual behaviour of any particular quantity is ultimately an empirical matter, but the empiricism can usefully be guided by the structured analysis which is now illustrated.

ACCRUAL ACCOUNTING AND MATCHING

The way so-called 'accruals' measures are modelled with the SACT structure can be illustrated in the context of Figure 2 by taking the case of one of the simplest performance measures—the contribution (see Horngren and Foster, 1987). This is defined as the difference between the revenues and 'variable' expenses arising in an activity class in an accounting period.[6] Assuming this is a short-term activity (as opposed to a long-term activity class such as holding or using a fixed asset), the recognition rule applied by an accountant in the calculation of the contribution is to enter the net result of revenues less aggregate expenses in the activity *only if* it is completed during the accounting period. Otherwise no value is entered in the contribution. Using our framework, the contribution in period t, J(t), may be described therefore as

$$J(t)=\sum_{i=1}^{i=N} C_i I_{(S_i \le t)} I_{(t-1<S_i+D_i \le t)} \tag{2}$$

where C_i, S_i and D_i are the cost, start time and duration of the ith activity, respectively, and N is the total number of activities (demand) over some longer decision horizon. The indicator functions take the value 1 if the subscripted condition is satisfied and zero otherwise.

Determining a stochastic process for S_i and D_i over the decision horizon also determines N so (2) obeys the general form described earlier in expression (1). It is quite typical of the form many conventional accounting numbers take and illustrates a general rule: *accounting numbers are functions of random sums of random numbers*. By fixing the distributional properties of individual inputs and outputs and the start and duration times of the activities into which they enter, the distributional properties of performance measures like J(t) can be derived either by empirical analysis or by computer simulation. As is probably evident, it is reasonable to conjecture that the contribution and, by extension, other similarly constructed accounting numbers such as accounting earnings, are quite likely to be normally distributed, asymptotically with respect to activity levels (Willett, 1991b).[7]

It is implicit in the interpretation given in Figure 2 and the argument thus far that the costs which are matched into activities to form activity costs are based upon the original transaction costs which first led to a debt relationship between the firm and some other accounting entities (i.e., original purchase and sale invoices) rather than upon those counterbalancing costs settling the original debts (i.e., usually, but not necessarily, 'cash' transactions). The latter remain in the background, unseen, so to speak. Evidently it would be just as easy to reverse those roles and leave the original invoice costs in the background instead, basing activity costs on cash transactions, in which case we would have a fully fledged cash accounting system. In view of the current interest in cash-based accounting systems and the empirical research on 'cash versus accrual' numbers as predictors of share prices, it is instructive to consider more precisely the nature of the relationship between accrual accounting and cash accounting and, in particular, their relative volatility over time from the perspective of the approach taken here.

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[6] An instance of an activity class is the purchase of inputs and their transformation into a single type of output.

[7] This is strongly supported by extensive simulation experiments.

It is helpful in this regard to consider the steps involved in moving from a system of accounting performance measurement based on pure cash flow, that is, one in which total cash expenses are deducted from total cash revenues in each period without regard to the matching of those expenses and revenues into activities; to an accruals system, that is where (a) debtors and creditors are accrued and (b) costs are matched in the conventional manner.

(a) Accrued but unmatched costs An example of an accrued but unmatched cost would be the recording of unpaid purchases without regard (yet) to whether those purchases had been consumed in productive activities. If the pure cash-flow measure in period t is denoted K(t) and the result of adjusting K(t) for debtors and creditors is denoted A(t) then:

$$E(K(t)) \rightarrow E(A(t)) \text{ as } t \rightarrow \infty. \tag{3}$$

The long-term time averages of both measures are identical, because 'timing differences' eventually reverse.

The relationship between 'accrued but unmatched' costs and cash 'costs' in period t (i.e., A(t) and K(t), respectively) prior to their being matched into activity-based performance measures may be determined from the basic bookkeeping identities as follows:

$$A(t)=K(t)+B_2(t)-B_1(t) \tag{4}$$

where $B_2(t)$ is the balance carried forward on the sales or purchase ledger and $B_1(t)$ is the balance brought forward. Consequently, defining the 'settlement' variable, G(t), as:

$$G(t)=B_2(t)-B_1(t), \tag{5}$$

it can be seen that:

$$Var(A(t))=Var(K(t))+Var(G(t))+2Cov(K(t),G(t)) \tag{6}$$

and thus that the variance of accrued but unmatched costs will be greater than the variance of cash costs if cash costs covary positively with the settlement variable.

The volatility of accrued but unmatched costs thus may possibly be greater than that of cash costs. However, the reason why accrued measures may nevertheless be preferred to cash measures can be illustrated by extending the analysis. It is possible to manipulate the settlement variable (e.g., by delaying settlement of purchase invoices at the financial year end) and it can be seen by a simple illustration how this might then increase the volatility of the cash variable (without reflecting the substance of any underlying economic event). For example, suppose a firm has a life of four accounting periods, incurring net expenses of \$1 in periods 1 and 2, \$0 in period 3 and net revenues of \$-3 in final period 4. The lifetime profit of this firm is

$–1 and the profit per unit of time is $–1/4. The time averaged 'variance' of the accrued cost flow is $43/16. Now if managers were to delay the payment of the net expenses to period 3 a similar calculation shows that, while the average profitability remains the same, the variance over time (i.e., the volatility) of the cash cost figure increases to $51/16. This simple example illustrates the conceptual point that manipulation of this type *can* lead to an increase in the volatility of accounting measures based upon pure cash data. This point (that is, the potential of conventional accounting procedures and adjustments to reduce or increase the volatility of accounting performance measures and thus the possibility of choosing, by careful judgments, only those which result in decreased volatility) is one which reappears below in the analysis of the accountant's matching procedure and later in discussing the nature of accounting allocation practices.

(b) Matching The above analysis was carried out on the assumption that expenses were not matched to revenues so that the comparison was between the behaviour of changes in aggregate cash balances and changes in debt over time. The process of matching costs into activities as described earlier has, however, additional statistical implications for accrual accounting performance measures. As can be seen from the following simple example, the matching procedure may be expected to smooth earnings calculations over time around long-term average profit. Over a four-year period suppose a firm embarks on a project to produce two products where the expenditure on the first product is made in year 1 and sold in year 3 and the expenditure on the second product is made in year 2 and sold in year 4. Let the amounts be, respectively, $1, $2, $3, $4. The long-term profitability of the project is $–1/2 (i.e., (($–2+$1)+($–4+$3))/4). Without matching the recognized pattern of the cost flow (whether measured by cash or accruals) is $1, –$2, $3, –$4 and its time averaged 'variance' around long-term profitability is $29/4. With matching the recognized pattern of cost flow is $0, $–1, $0, $–1, thus reducing the 'variance' to $1/4.

As with the preceding case of the effect of unmatched accruals, this simple example is only an illustration of the potential statistical effect that matching has on accounting performance measures. However, this effect is probably more than a mere aberration as can be seen from considering the following more general example. Let the probability distributions of the value of the inputs, x, and outputs, y, into a process be denoted respectively as f(x) and g(y). Given the sign conventions adopted, $y<0$ and $x>0$. Assume that the inputs and outputs are independently and identically distributed over a relatively long, fixed period of time, T.[8] Suppose that the arrivals of the inputs into the process are generated by a Poisson process and that the time to completion of the activity, when a sales invoice is raised, is exponentially distributed. Continuing the previous analysis and assuming equal length accounting periods, t=1,..., T, we might ask the following question. Which has the lesser variance over time around the time averaged profit of the process $(\sum_t x_t + y_t/T)$: A(t), the total of the unmatched but accrued costs per period, whereby revenues and expenses are recognized as they arise; or J(t), the sum of matched and accrued costs per period, whereby expenses are recognized only when the relevant inventories are sold?

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[8] For simplicity it is also assumed that there is one invoice for each input and output and one input for each output.

Defining the variable z as 'z=x or y', then h(z)=1/2{f(x)+g(y)} is the probability distribution of sampling either a purchase invoice or a sales invoice in a particular period. In this case:

$$E(Z)=\tfrac{1}{2}\{E(X)+E(Y)\} \tag{7}$$

and:

$$Var(Z)=\tfrac{1}{2}\{Var(X)+Var(Y)\}+1/4\{E(X)-E(Y)\}^2. \tag{8}$$

Alternatively, if invoices are matched with sales invoices and recognized only as a sale takes place then a new variable, Z^*, can be defined as $z^*=y+x$, in which case:

$$E(Z^*)=E(X)+E(Y) \tag{9}$$

and,

$$Var(Z^*)=Var(X)+Var(Y)+2Cov(X,Y) \tag{10}$$

Now A(t) the unmatched accrued cost flow is:

$$A(t)=\Sigma_i Z_i \text{ for } i=1 \text{ to } N_t \tag{11}$$

where N_t is the random number of invoices accrued in period t, regardless of whether they are sales or purchases invoices, and J(t), the contribution by matched, accrued costs in period t is:

$$J(t)=\Sigma_i Z^*_i \text{ for } i=1 \text{ to } N^*_t \tag{12}$$

where N^*_t is the random number of matched invoices accrued in period t. Given the distributional assumptions in this case it follows that Var(A(t))>Var(J(t)), the reduction in variance being proportional to E(XY).[9] Put simply, the netting off of positive and negative costs draws the contribution nearer to the mean profit per unit of time. Thus, in this instance, the matched contribution would be smoother than the unmatched cost flow, a fact which it seems likely will extend to more general settings. As before, this analysis suggests a possibility for this approach to reveal the statistical characteristics of basic accounting measurement procedures. It may also be useful in more carefully exploring the correlations between cash flows and accruals data in empirical research (e.g., the work of Bowen *et al.*, 1987, and others).

ALLOCATIONS

In this section some applications of the framework described in the previous sections to the specific issue of allocations are outlined. These still deal with probabilistic and statistical issues, but shift the attention to more general ideas. Problems addressed concern the basic conceptual issue of whether practices involving the allocation of accounting numbers, *interpreted as measurements of something*, actually provide information about economic events. According to the arguments of Thomas (1969, 1974), accounting allocations are 'incorrigible'—they appear to be impossible to rationalize as measurements using the traditional perspective of economic theory. Avoiding arguments about economics, an alternative perspective is advocated here. It interprets accounting measurement statistically and the interpretation given to allocations is one example of this viewpoint. The basic idea that allocations are estimates of more fundamental economic attributes follows Brief and Owen (1970, 1973). However, the underlying framework of SACT allows their thesis to be developed without it being compromised by the problems of interpretation (correctly identified by Thomas) which follow from the contrary assumption that accounting measurements attempt to *directly* measure the value of assets and that accounting income either does or should reflect differences in those values over time.

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[9] The exact amount of the reduction depends upon the ratio of the parameters of the Poisson and exponential distributions. The authors' thanks go to John Lane and James Booth for calculating and confirming this result.

The examples in this section are divided into two distinct categories: cross-sectional allocation and time-series allocation. *Cross-sectional allocation* refers to the technique adopted by accountants when it is necessary to find an appropriate value to assign to activities at some definite accounting date and where exact cost information is unavailable from invoices. The LIFO and FIFO techniques used to value inventories in financial statements are instances of this type of allocation, as are standard costing systems. *Time-series allocation* refers to the practice of dividing costs (such as the cost of a fixed asset, for example) over different accounting periods.

Cross-Sectional Allocation

Faced with the problem of valuing a separable activity at a point in time, in the absence of exact transaction data, an accountant will estimate the actual costs involved. Such an estimation process may be rationalized in our framework in the following way. The typical cross-sectional allocation problem facing the accountant is to have composite invoice data relating to a set of resources, only part of which enters into a particular activity. Let the resource elements entering into an activity be denoted by the set $a=\{a(1), a(2), \dots, a(n)\}$ and let each element be part of the sequence of composite invoices relating to the cost of $a_1=\{a(1),b(1),z(1)\}$, $a_2=\{a(2),b(2),z(2)\}$, etc. The b elements represent all the proper resources in the invoices apart from the a elements and the z elements represent the synergistic component in the invoice.[10] By the activity cost-representation theorem and letting the resource components represent their costs, $a=a(1)+a(2)+ \dots + a(n)$ and $a_1=a(1)+b(1)+z(1)$, $a_2=a(2)+b(2)+z(2)$, etc., it is a matter of establishing a rational basis on the grounds of some general principle for choosing values for a(1), a(2), etc. using composite information. Two common and essentially different ways in which the accountant responds to this allocation problem are: (a) a single cost value is assigned on an item by item basis to each element in the activity by reference to the specific invoice in which its cost is included; (b) a 'standard' cost is assigned to similar elements by reference to evidence gathered from a variety of sources as to the likely individual cost. Using our framework both of these allocation approaches can be assessed in terms of standard statistical criteria.

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[10] Synergy elements are special elements of the resource set (see Table 1(b)) which can be understood by a two element example. Suppose that there are two 'proper' resource elements, a_1 and a_2. Then the resource set A, based upon these proper elements, consists of the elements a_1, a_2 and, possibly, $<a_1,a_2>$ where the last element (the 'synergy' element) represents the circumstance in which the resources are transferred together. In the case of a three-element resource set there would be five possible additional elements representing the number of ways in which different subsets of resource elements could be combined; in the case of a four-element set there would be eleven synergy elements, etc. The cost of $<a_1,a_2>$ in a two-element set, $c(<a_1,a_2>)$ is defined as $c(A)-c(a_1)+c(a_2)$. Only one synergy element can be associated with a particular transaction but all may be important in considering the market value of a set of resources (as is discussed below, see 'Market Values').

1. Choosing a 'point' estimate of an actual unit cost from the information contained in a composite invoice requires knowledge of, or assumptions about, two types of joint distribution of the costs of the resource involved, one including the synergy cost element, the other excluding it. Purchased separately, individual resources have a joint distribution of costs from which synergy elements are absent.[11] Purchased together, the joint distribution includes the additional synergy element. Information on both types of joint distribution is necessary, strictly speaking, to estimate per unit costs in composite invoices. This process necessitates the use of market data as well as strictly 'historic cost' data and may be illustrated by means of the following simple example.

Suppose that two resource units a and b which have been purchased together in a composite invoice for $4 enter into two separate activities and for this reason need to be costed separately for some purpose. It is known from other sources that, individually, a costs either $1 or $2 and b costs either $2 or $3. Suppose sufficient information is available concerning the joint distribution of the costs of the resources including the synergy costs and that the relevant marginal probabilities concerning the cost of $A=a\cup b\cup z=\$4$ are as follows (omitting the functional notation for convenience):

$$P(A=4|(a=1,b=2))=2/5;\ P(A=4)|(a=1,b=3))=4/5;$$
$$P(A=4|(a=2,b=2))=3/4;\ P(A=4)|(a=2),b=3))=11/20 \qquad (13)$$

Using Bayes' theorem, the probabilities of the different combinations of unit costs given the composite invoice costs of $4 are:

$$P((a=1,b=2)|A=4)=16\%;\ P((a=1,b=3)|A=4)=32\%;$$
$$P((a=2,b=2)|A=4)=30\%;\ P((a=2,b=3)|A=4)=22\% \qquad (14)$$

For the purpose of the illustration, equal prior probabilities of $P(a=1,b=2) = \ldots = P(a=2,b=3)=1/4$) have been applied to obtain a solution. The allocation maximizing the posterior probabilities for these priors is a=$1 and b=$3. This Bayesian approach could be used to justify altering the equiprobable priors to the new posterior values in case another composite invoice is sampled, thus incorporating additional information into later estimates of the probabilities. The allocation chosen thus depends upon available information. When point estimates of this type ignore unstated discount and goodwill payments it is equivalent to making the implicit assumption that z=$0 with probability 1. This would only be generally correct if markets were perfect and complete. However, such an assumption may not be unreasonable as an approximation in many practical circumstances.

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[11] The joint distribution of separate costs may not be the product of their marginal distributions due to economic factors like substitutability and complementarity.

This criterion for cross-sectional allocation rests upon a justification for the Bayes postulate or some other generally applicable statistical criteria such as the maximum likelihood principle. However, the resulting allocations are no more 'arbitrary' than are other estimates of parameters made in statistical inference. Presumably costing techniques such as average, FIFO and LIFO could be assessed by their ability to produce Bayesian or maximum likelihood estimates of actual costs. Also explicit consideration could be given to the broader question of whether interval estimates would be sufficiently superior to point estimates to justify their inclusion in financial reports This is a disclosure issue which nevertheless demands statistical consideration. Such estimates could be produced with additional information about the variances of the distributions involved.

2. The technique of average costing has some similarities with standard costing—the second instance of cross-sectional allocation mentioned above. In a statistical context it is natural to interpret standard costs as aggregations of average per unit input costs within activities (as is done in basic management accounting tests such as Horngren and Foster, 1987, in which case some justification of the number assignments and resulting arithmetic is called for. In our framework, complex activities based upon production relations of the type described earlier are statistically represented by random sums of individual resource unit costs. An activity consisting of combining the resource sets $\cup a_i$, i=1 to r, where the number N(i) of elements a(i) in a_i is a random variable (rv) whose probability depends upon technological factors, is itself an rv. Denoting the random value of the activity as A, it has an expected value of the form:

$$E[A]=\sum_{i=0}^{i=r}E[A_i] \text{ where } A_i=\sum_{i=0}^{i=N(i)}A(i) \tag{15}$$

where A(i) is the rv of the cost of the single element a(i). If N(i) is statistically independent of A(i) for all i, then:

$$E[A]=\sum_{i=0}^{i=r}E[A_i]E[N(i)] \tag{16}$$

This is the usual basis of standard costing price and quantity variance analysis.[12] As with the point estimate case, therefore, it is sufficient in our framework, given the stated assumptions, to appeal only to elementary statistical principles in order to justify the basic calculations associated with standard cost numbers. It is, in fact, possible to compute general formulae for the standard deviations of standard costing variances and to analyse the conditions under which potentially significant statistical correlations between standard costing variances occur by developing this approach (see Booth and Willett, 1997).

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[12] The 'variances' of standard costing are therefore what would be called 'deviations from the mean value' in statistics and should be interpreted accordingly.

Time-Series Allocation

The most important example of time-series allocation in accounting from a practical point of view is the depreciation calculation, that is, the method of dividing the cost of a fixed asset and allocating it to a number of accounting periods. Most accounting theory treatments of this topic follow Thomas (1969) and start from the assumption that such adjustments to the accounting earnings figure are arbitrary. They then seek to find some non-measurement explanation for the process—as, for instance, in the idea that certain types of allocation method may lead to more appropriate organizational behaviour on the part of management (e.g., Hughes and Scheiner, 1980). Our framework, in contrast, suggests a measurement rationale for the depreciation calculation, namely that it may be interpreted as a statistic which averages activity costs with respect to time. The general idea, which like the preceding analysis is similar to the Brief and Owen thesis, is set out below.[13]

The simplest form of accounting earnings is the historic cost calculation unadjusted for depreciation, i.e. basically the same expression as (2) which for present purposes can be slightly reformulated, as follows: The sum

$$J|(T=t) = \sum_{i=0}^{i=N|(T=t)} C_i I_{(D_i<t-S_i)} \tag{17}$$

is the accumulated earnings before depreciation at time t in a single class of activities and is equivalent to the accumulated contribution at t. The slightly amended conditional notation $J|(T=t)$ and $N|(T=t)$ (compared to that adopted in (2)) has been used to emphasize the historical focus and the dependence of the calculations on t. Consequently, the historical cost performance measure,

$$dJ|(T=t)=J|(T=t)-J|(T=t-1) \tag{18}$$

is the profit before depreciation (or, with a slightly different interpretation of start and duration times as explained in the preceding section, the cash flow) during the accounting period ending at t.

Calculations like those in Table 3 and (18) are frequently used as the basis of performance measurement in accounting contexts. Typically, the decision-maker has a collection of activities (as in Figure 2) which have different start and finish times and often straddle accounting dates and it is desired to compare them, for example, on the basis of their relative ability to generate net revenue in favour of the firm over time. The time series allocation problem is: Why use calculations of the type shown in Table 3 which are more complex than those of type (18) and include 'subjective' information such as the depreciation calculation? Our theoretical approach provides a possible answer. In the context of a given project with a common start time and finish time, all calculations of the above type have a common expected value over the project period. Hence, when such calculations are used as estimators, whatever they may be used to estimate, comparison of their variances could be used to identify the best candidate for the job on the basis of the standard minimum mean squared error criteria. To see how this works as applied to the earnings figure, let the project duration be $[O,v)$ and t be a point in the interval. By the definition of a project, the events $D<O$ and $D_i>v-S_i$ have zero probability. Therefore, writing (1) in Table 3 in the conditional notation gives:

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[13] Brief and Owen (1970) were the first modern writers to propose an explanation of the depreciation calculation based upon statistical estimation criteria.

$$H|(T=t)=\sum_{i=0}^{i=N|(T=v)} C_i+\{f_i(t-S_i)-C_i\}I_{(D_i>t-S_i)}. \tag{19}$$

Similarly, if $dH|T=t$ is defined as in Table 3 then,

$$\Sigma_t dH|(T=t)=H|(T=v) \tag{20}$$

Treating T as being uniformly distributed on $[O,v]$, therefore:

$$E[dH]=1/vE[H|T=v] \tag{21}$$

Since $H|(T=v)$ is simply an instance of a random sum of random numbers, if C and $N|(T=v)$ are independent then,

$$E[dH]=1/vE[C]E[N|T=v] \tag{22}$$

This shows that the expected value of performance calculations of the type based on (18) and expression (2) in Table 3, taken over equally weighted accounting periods, whether depreciated or not, is the time average of the expected costs per activity multiplied by the expected number of activities completed (usually products sold) in the project period. Consequently, an appeal to the standard statistical criteria of minimizing the mean squared error could be used to judge whether the depreciated or the undepreciated calculation is the most efficient estimator of project profitability. Formulae for optimal depreciation patterns derived on this basis and obtainable from more specified models are discussed in Lane and Willett (1997).

MARKET VALUES

This and the previous section deal, from the point of view of our framework, with a fundamental accounting measurement question. The 'Allocations' section addressed the matter of allocations in financial accounting, that is, how does one provide a rational basis for dividing up basic accounting measures between activities? Now we examine the converse issue: that of establishing a logically consistent basis for interpreting the aggregation of accounting numbers across activities (and, in particular, across assets). The additive properties of transaction costs follow directly from our basic axioms and it is now intended to extend our analysis to address the more perplexing problem of the additivity of market values. This is a matter of both practical and theoretical significance.

Accountants occasionally report market values of assets instead of actual historic costs. In the English-speaking world there is more of a tendency to do this in the U.K. and Australia than in North America. This information is often used in an informal disclosure context despite the fact that certain fundamental issues relating to the meaningfulness of the adding market values together have never been satisfactorily resolved (Ijiri, 1965; Chambers, 1966; McKeown, 1972; Vickrey, 1975).

This so-called 'aggregation problem' and its resolution using our transactions-based approach to interpreting market values are closely related to the manner in which the cross-sectional allocation problem was dealt with in the preceding section, as will be seen from the following analysis.

Market value aggregation refers to the process of adding together the market values of individual assets to arrive at a total market value. The problems associated with this practice, if we interpret market values as direct, deterministic measurements of value are well known and apparently insoluble. Not only do aggregate market values rarely agree to the sum of the individual parts but the values are dependent on the pattern of acquisition (Vickrey, 1975). Our framework, which depends essentially on the inclusion of synergy elements in the resource set (as outlined in the preceding section) takes a statistical approach to the definition of market values. It opens the way for a more complex and general analysis of market values as vehicles of economically significant information (see also Hodgson *et al.*, 1993).

The basic idea, earlier outlined in Example 2 of Table 3, is to define the market value of a resource set at a particular time as an estimate of the theoretical, average transaction cost (or, equivalently, price) which would be realized from trading in that resource set at that time. Thus market values are viewed as indirect, derived measurements linked to economic events through either observable or potentially observable transactions rather than as directly observable attributes of an 'asset', as has typically been the case, in economic and accounting theory, in the past. The accounting concept of 'goodwill' is similarly interpreted as an average synergy cost so that, in conjunction with the aforementioned definition of market values, an internally consistent rationale is provided for the practice of adding together the market values of a list of assets, including an item for goodwill, such that the total gives a meaningful market value for the set of assets as a whole.

This transactions-based theory of market values may be more formally and precisely explained as follows. For the entity x_i, the market value, of the resource set a_i in the time interval w_i is defined as the expected value of the following conditional probability distribution:

$$P(V_i=C_i|x_i,\ a_i,\ w_i), \tag{23}$$

that is, the probability distribution of costs C_i which have the single varying component y_i (the potential purchaser or seller). The V_i's are additive under the activity cost representation theorem and it follows the market values as thus defined can be straightforwardly interpreted as average costs (or average prices).

To avoid the aggregation problem it is necessary that the sum of the individual market values of a list of resources have the same total value as the market value of those resources taken together as a single set, that is:

$$\Sigma\mu_i = \Sigma_i\, E[V_i] = E[\Sigma_i\, V_i] = \mu_{\Sigma i} \tag{24}$$

To satisfy this relationship, a term representing the way in which elements of the resource set may be combined must be included in the analysis (Vickrey, 1975). One way to achieve a solution to this problem is to use the costs of the synergy elements defined earlier in the context of the analysis of cross-sectional allocations (see note

10). Let $V_{\Sigma(j)}$ be the sum of the random costs generated by the prospective purchase or disposal of each subset in the j^{th} partitioning of a resource set and let V_m be the special sum generated by the minimum partitioning where the individual resource elements are transacted separately (i.e., the subsets are singleton sets). Then define the synergy value of the j^{th} partitioning, $Z_{\Sigma(j)}$, as:

$$Z_{\Sigma(j)}=V_{\Sigma(j)}-V_m \tag{25}$$

This attributes a unique (random) synergy value to $Z_{\Sigma(j)}$ which is the sum of the cost of the synergy elements associated with that partitioning of the resource set. For each of the k ways in which the total resource set may be partitioned (Sunder, 1978) there will be an associated sum of random variables $Z_{\Sigma(j)}$, for j=1 to k. Treating each partitioning as equally probable,[14] and letting Z be the synergy value associated with the average partitioning, the total market value of the asset set, V, E[V], is then given by:

$$E[V]=E[V_m]+E[Z] \tag{26}$$

The distributions of V and Z are unique given the minimum level of aggregation upon which synergy values are based. The latter fact guarantees that $E[V_m]$ can be broken down into a listing of the expected values of individual proper resource elements in accordance with (24) and also generates the maximum information sample space for Z which other partitionings fail to do. E[Z] can be thought of as the market value of goodwill and is, in effect, an additional tangible asset in the total resource set (as indeed it is often reported in financial statements). Under the framework being proposed here for interpreting accounting measurement practices, therefore, and unlike the alternative direct economic value approach to understanding these matters, there are no profound conceptual difficulties in representing the total market value of a firm's asset as an additive list of expected values of potential transaction costs, so long as a term for 'goodwill' is included in the list.

CONCLUSIONS AND IMPLICATIONS

This article has presented an alternative framework for understanding accounting measurement based upon a statistical interpretation of transaction costs and production relations and referred to generically as 'statistical activity cost theory'. A number of issues have been addressed: a clarification of the important conceptual distinction between measurement and disclosure issues in accounting; the provision of a rigorous and logically consistent model of accounting's basic measurable variables; and a probabilistic interpretation and analysis of several key areas of concern in accounting theory, namely, the relationship between cash flow numbers and accruals, and the nature of accounting allocation and aggregation practices. The underlying message is that while disclosure and use aspects of accounting are obviously of considerable importance, too little is currently known about the statistical properties of the numbers (the 'reality') that accountants create and which are used for many different purposes to inform users. Our framework provides a sound theoretical basis to address this important matter.

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[14] The assumption of equiprobabilities is a convenience and is not necessary to the main argument.

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APPENDIX

This appendix contains more details of the formal definitions of the basic accounting identities and financial accounts.

Under the activity cost approach the natural set theoretic definition of the financial accounts of a firm z during the period time w=(u,v), $(z)fs^w$, is:

$$(z)fs^w=\{c_i,c_i\hat{}\,|x_i \text{ or } y_i=z_i,\ w_i=w\},$$

that is, they are the set containing all the costs (and their duals) of z incurred in the interval w. *Financial accounts* are then restrictions of this definition in which u=0, i.e. the set of costs of z up to time v. These definitions are consistent with the essential arithmetic properties which financial statements are expected to possess. The arithmetic identities are shown in Figure 3 in the text.

The balance-sheet identity The transaction theory viewpoint of assets and retained profits ('equities') as unfinished and finished activities respectively, suggests the following object language definitions: Let t_{max} be the latest time associated with the resource elements of an activity and the production sequence which determines that activity, then, with respect to a particular firm, Definition: The cost incurred in an activity is an asset at v iff $t_{max} \geq v$. The cost incurred in an activity is an equity at v iff $t_{max} < v$.

The production flow and continuity of production axioms prevent completed pr's becoming reactivated at a later date and thus assets and equities are well defined over time. The resource components of assets and equities are mutually exclusive and exhaust the active resource set of a specific firm. Consequently if the funds of z are defined as the total costs incurred in economic activities by z, the activity cost representation theorem immediately leads to the conclusion that assets + equities=funds.

Changes of funds identity This identity involves costs changing over time, say between the two points u and v. Let a^u be the resource set of z active up to u and a^v be the resource set of z active up to v. Then, ignoring the first two components of costs which are held constant (i.e., the x and y components), the monetary value of funds in the opening resource set at u, denoted $(a^u,[O,u))$ is equal to the monetary value of funds in the closing resource set at u, $(a^v,[\theta,u))$. If this was not the case then costs with a resource component from the set $a^v–a^u$ would be debited or credited during $[O,u)$ contrary to the consistency axiom. By axiom 1 $(a^v,[u,v))$ and $(a^v ,[u,v))$, the change in funds during the accounting period $[u,v)$, add to give $(a^v,[O,v))$. Therefore by substituting the first of these terms as indicated the change of funds identity is derived.

Capital maintenance Let $(*a^u,[O,u))$ and $(*a^v,[O,v))$ be, respectively, the opening equities at u and the closing equities at v. Profit before any provision adjustments is the cost accrued in activities finishing between u and v, i.e. $(*a^v–*a^u,[u,v))$. It is therefore necessary to show that $(*a^u,[O,u))+(*a^v–*a^u,[O,v))=(*a^v,[O,v))$. By the definition of equities the elements in $*a^u$ are inactive after u. Therefore by the consistency axiom and axiom 1 these have a monetary value of zero. Consequently, $(*a^u ,[O,u))=(*a^u,[O,v))$. Since the activity cost representation theorem implies that $(*a^u,[O,v))+(*a^v–a^u,[O,v))=(*a^v[O,v))$ the capital maintenance identity follows by substituting the first term.

The remaining identities in Figure 3 are immediate with the appropriate definition of asset changes, that is, asset additions in $[u,v)$ less opening assets consumed in $[u,v)$. It is also clear that any amounts transferred between asset and equity accounts in respect of provision adjustments such as depreciation calculations, estimates for bad debts, etc. will not, under conventional accounting procedures, disturb these identities.

The definition of financial accounts and statements given above allows the derivation of two essential closure properties governing the aggregation of fs's across firms and across time.

Aggregation across time Let fs^u and fs^v be the financial statements of a specific firm at times u and v respectively and let fs^{uv} be the accounts of the intervening period $[u,v)$. By the consistency axiom non-null costs in fs^u have active resource components in $[O,u)$ and these are in $[O,v)$ by construction. Hence such costs are also in fs^v. Similarly non-null costs in fs^{uv} are in fs^v. Conversely non-null costs in fs^v have active resource set components in either $[O,v)$ or $[u,v)$ which must, to avoid contradiction, be components of costs either in fs^u or fs^{uv}. Consequently $fs^v =fs \cup fs^{uv}$. This result reflects the basic practice of preparing fs's by adding transactions in an accounting period to the balances brought forward from the previous accounting period.

By slightly modifying this argument, the principle underlying consolidation accounting can just as easily be demonstrated i.e. that $(x\cup y)fs=(x)fs\cup(y)fs$ where (x)fs and (y)fs are the financial statements of firms x and y at a specific date respectively and $(x\cup y)fs$ is the consolidated accounts of the firm $x\cup y$. This states the basic fact that the fs's of the group entity $x \cup y$ depend only the individuals fs's of its subsidiaries and that it is unnecessary to look outside these for any further cost information regarding the group.

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Information Provided by Accrual and Cash-Flow Measures of Operating Activities

This article examines accrual and cash-flow measures useful for observing companies' financing, investing and operating activities. It addresses the information provided jointly by income and operating cash flow, and reveals that information provided by these accounting measures is dependent on their relative magnitudes. A consistent pattern of income in excess of operating cash flow, with both measures appropriately adjusted and scaled, indicates superior company growth. Income and cash-flow patterns are associated significantly with various company financing, investing and operating attributes. Empirical tests confirm that both income and operating cash flow are important for observing company performance and prospects when considered jointly and when interpreted with respect to accounting measurement theory. At least for many companies, the results do not support the conventional wisdoms that accounting measures of income and operating cash flow converge over long periods of time and that earnings provide a reliable basis for cash-flow prediction.

Key words: Accounting measurement; Accrual accounting; Cash flows; Corporate performance; Growth; Income; Operating cash flows.

This article investigates accrual and cash-flow measures useful for observing corporate financial performance. Empirical research involving the accrual/cash-flow relation has concentrated primarily on information provided by reported earnings and the related components of accruals and operating cash flow (e.g., Bowen *et al.*, 1986, 1987; Rayburn 1986; Wilson, 1986, 1987; Bernard and Stober, 1989; Board and Day, 1989; Livnant and Zarowin, 1990; Deechow, 1994). Those works examine the incremental information provided by accruals with respect to cash flow[1] or the incremental information provided by cash flow with respect to earnings.

We examine the information provided jointly by accrual and cash-based measures. Accounting measurement theory provides a basis for identifying this information. A theoretical analysis of the accounting measurement process indicates that the information provided by accrual and cash-based measures depends on their joint relation rather than on either measure alone or on their incremental contributions. In the analysis presented and

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[1] Cash flow hereafter refers to operating cash flow, unless otherwise noted.

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tested here, cash flow modifies (rather than adds to) the information conveyed by income.[2] For example, two similar companies that report the same amounts of income are valued differently by the market if their contemporaneous operating cash flows differ. But the valuation difference is not a monotonic function of the magnitude of cash flow.

The information provided jointly by income and cash flow is an outcome of the accrual accounting measurement process. The purpose of this article is to develop and assess expectations associated with information conveyed jointly by measures of income and cash flow. We demonstrate that operating income and operating cash flow together provide information about financing, investing and operating activities that signal companies' future growth and earnings prospects.[3]

The primary results demonstrate that, in cross-section, companies that report higher amounts of operating cash flow than income (after adjusting for the differential effect of depreciation and amortization and standardizing for size) exhibit lower levels of growth, and smaller increases in income and operating cash flow over time, than companies that report similar levels of income and with higher amounts of income than operating cash flow. Other financing, investing and operating attributes of these companies differ as well. These differences also are associated with differences in the market valuations of companies. In particular, the market-to-book value of equity ratios and market returns are higher, on average, for companies reporting higher income than cash flow than for companies with the same level of income but reporting higher cash flow than income. That is, for two otherwise identical companies that differ only with respect to operating cash flow, the company with the higher operating cash flow is valued less by the market than one with lower operating cash flow.

Results of the analysis underscore the importance of reporting both accrual and cash-flow measures. They provide evidence refuting the position that cash-flow measures are largely redundant with respect to accrual measures or that a high degree of conformity occurs between these measures over long periods of time (e.g., see FASB, 1978). We demonstrate that, for many companies, accrual and cash-based measures diverge over extended periods of time. These results, which have not appeared previously in the literature, contrast with the conventional wisdoms that income and cash-flow measures converge over time,[4] and that the role of cash-flow information is limited primarily to evaluation of liquidity (e.g., Eggington, 1984; Staubus, 1989). Instead, our analysis indicates that cash-flow and incomes measures together are useful for evaluation of growth and growth prospects that have implications for the value and survival of business organizations

[2] Our approach does not specifically address the quality of earnings issue that has motivated some prior studies (e.g., Bernard and Stober, 1989). We assume that both accrual and cash-flow numbers are, generally and on average, reliable indicators of economic activities.

[3] Our arguments are not inconsistent with theory that explains equity valuation in terms of earnings (e.g., Ohlson, 1990, 1995). Earnings are viewed in this theory as an indicator of future cash flows to stockholders: dividends and security payoffs. The sequence of actual dividends is not regarded as informative. In addition, the theory does not address the relation between operating cash flows and earnings. Operating cash flows can affect the implications of current earnings for future earnings, for example.

[4] If time is defined to include the life of a company, income and cash flow must be equal. This outcome is trivial, however, and has no practical importance for companies that are going concerns.

ANALYSIS OF ACCRUAL AND CASH-FLOW MEASUREMENT

The relation between accrual cash-flow measures of operating activities is determined by the conventional rules of accrual accounting. Therefore, it is important to examine these rules to identify expectations about the relation. This section outlines the *a priori* results of this process.[5]

A Cash-Flow Model of Business Activities

The basic financial statement equation can be written as:

$$C+CA+LA-DA = CL+LL+CC+RE, \qquad (1)$$

where C is cash,
CA is other current assets,
LA is long-term assets at cost,
DA is accumulated depreciation and amortization,
CL is current liabilities,
LL is long-term liabilities,
CC is contributed capital, and
RE is retained earnings.

Accordingly, the change in the financial statement equation from the end of one fiscal period to the end of the next can be written as:

$$\Delta C+\Delta CA+\Delta LA-DAE = \Delta CL+\Delta LL+\Delta CC+NI-D, \qquad (2)$$

where DAE is depreciation and amortization expense,
NI is net income, and
D is dividends.

Rearranging the terms in equation (2) produces:

$$\Delta C=(NI+DAE-\Delta CA+\Delta CL) + (-\Delta LA) + (\Delta LL+\Delta CC-D), \qquad (3)$$

where, following U.S. accounting rules, the first term in parentheses is operating cash flow (OCF), the second term is investing cash flow (ICF), and the final term is financing cash flow (FCF), assuming investing and financing activities are treated independently (e.g., no exchanges of debt for long-term assets).

To facilitate analysis, we can hold cash constant so that $\Delta C=0$, then:

$$OCF=ICF-FCF. \qquad (4)$$

If we add depreciation and amortization expense back to net income to make it comparable to operating cash flow, the difference between net income adjusted for depreciation and amortization expense and operating cash flow is:

$$(NI+DAE) - (NI+DAE-\Delta CA+\Delta CL) = \Delta CA-\Delta CL, \qquad (5)$$

or the change in working capital (ΔWC), where the first term in parentheses is the accrual measure of operating activities and the second term in parentheses is the cash-flow measure.

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[5] We acknowledge that exceptions may occur in practice to the results we describe, but we have (generally) omitted modifiers, such as 'typical', 'often' and 'on average', to avoid tedious repetition. Exceptions exist because the processes underlying the relation between accrual and cash-flow measures are complex.

An increase in working capital results primarily from increases in receivables, inventories and prepaid expenses, and decreases in payables. A decrease in working capital reverses the direction of these other changes. Increases or decreases in working capital are related jointly to financing cash inflows and investing cash outflows.

Also, we can examine partial relationships with respect to the difference between net income and operating cash flow (change in working capital), investing cash flow (as a measure of investing activities), and financing cash flow (as a measure of financing cash flow). For example, if we assume no financing activities and hold net income (adjusted for depreciation and amortization) constant, an increase in working capital is associated with a decrease in cash outflow for investing activities; that is, an increase in working capital results in a decrease in operating cash flow relative to net income. Holding financing cash flow at zero, a decrease in operating cash flow results in a decrease in investing cash outflow: that is, less cash is available for purchase of assets.

If we assume no investing activities and hold net income constant, an increase in working capital is associated with a decrease in cash outflow for financing activities. An increase in working capital results in a decrease in operating cash flow. Holding investing cash flow at zero, a decrease in operating cash flow results in a decrease in financing cash outflow: that is, less cash is available for repayment of debt, repurchase of stock or payment of dividends.

However, if we look at these relationships jointly, we find different scenarios are possible. For example, an increase in working capital (a higher excess of net income over operating cash flow) means that less operating cash flow is available. A company with good growth (asset investment) opportunities will require additional financing to take advantage of these opportunities. If increases in working capital are associated with good growth opportunities, we should expect to find companies in this situation to be investing and financing at higher rates than companies with poor growth opportunities and associated with decreases in working capital. Thus, the important relationships are joint (i.e., what happens to investing *and* financing activities), rather than partial (i.e., what happens to investing *or* financing activities independently).

Accrual and Operating Cash-Flow Relationships

Attention now turns to the relationship between accrual and cash-based measures of operating activities more specifically. Accrual accounting seeks to calculate operating performance in financial terms by matching sales revenues with related expenses for a designated period. Revenues are recorded at the time goods and services are sold to customers. Often these sales are on credit, resulting in an increase in receivables. Cash is collected at some future time. Therefore, an increase in sales revenues typically is accompanied by an increase (change) in receivables (ΔR), and operating cash inflow (C) lags sales.

Inventory costs are expensed when goods are sold. Cash outflow for inventories usually precedes sales. As sales increase, a company purchases additional inventory (ΔV) to support expected future sales. Thus, the cash outflow for inventory leads the cost of goods sold. The same is likely for prepaid expenses. As sales increase, a company will be likely to invest in higher levels of prepaid expenses (ΔP) to support the higher levels of operations. Similarly, cash outflow leads operating expenses. Payables and accrued liabilities also typically increase with an increase in sales. Higher levels of purchases and resource requirements result in increases in current liabilities (ΔL). These increases partially offset the increase in current assets and reduce the lag between operating cash flow and accrual-based income. The offset is seldom complete, however, because payables relate mainly to the purchase of inventories, and accrued liabilities generally are not of the same magnitude as other current assets. Thus, as sales increase, current assets would often be likely to grow more rapidly than current liabilities.

If sales decrease during a period, the accrual/cash-flow relation operates in reverse. A decrease in sales results in a lower level of receivables. Cash collections exceed sales, as collections are made from higher levels of sales of prior periods. At the same time, inventories are permitted to shrink as demand increases. Therefore, less cash is required to replace inventory, and the cost of goods sold figure is higher than cash outflow to suppliers. Prepaid expenses also exceed cash payments. Thus, net operating cash inflow is higher than accrual-based income. The current asset effect is partially offset by a decrease in current liabilities.

The net effect of the accrual/cash-flow relation as posited is that income exceeds operating cash flow when a company is growing, especially if it is growing rapidly. The higher the growth rate, the more cash flow will lag income. Conversely, as the rate of sales declines, the extent of the lag decreases, and eventually operating cash flow leads income, especially during a period of contraction.

Two other factors affect the relation between income and operating cash flow. The first is taxation. As accrual-based income increases, *ceteris paribus*, the provision for tax also increases. Tax payments tend to lag the tax provision, through the use of accounting rules delaying the recognition of income for tax purposes (e.g., accelerated depreciation and other accelerated expense write-offs, such as research and development), and the typical delay in settling tax liabilities. Thus, as sales increase, deferred taxes tend to increase (ΔT), reducing the lag of operating cash flow relative to income (assuming both are measured on an after-tax basis). The converse applies when sales decrease.

The second additional factor affecting the accrual and cash-flow relation is the effect of depreciation and amortization (DAE). Depreciation and amortization expenses decrease accrual-based income. The cash flow associated with these expenses precedes accrual recognition but is not treated as an outflow reducing operating cash flow. Instead, it is reported in the U.S. as a component of net cash flow for investing activities. The amount of depreciation and amortization expense increases as a company expands. Additional fixed assets are added to support increased production and sales. The increase in fixed assets and the acquisition of existing companies to increase production and sales capacity increases depreciation and amortization expense. As sales decrease, the rate of growth in these assets also decreases. If sales decreases are severe, a company may be required to sell existing fixed assets to reduce operating expenses (and, perhaps, meet liquidity constraints). These reductions also reduce depreciation and amortization expenses. Therefore, the relation between income and operating cash flow must be adjusted for depreciation and amortization. Otherwise, we can expect operating cash flow to be higher than income, on average, even if there are no changes in current assets and liabilities.

The net effect of the accrual/cash flow measurement process as stated above can be expressed as:

$$NI+DAE=OCF+\Delta R+\Delta V+\Delta P-\Delta L-\Delta T, \qquad (6)$$

where equation (6) is equivalent to equation (5) and $\Delta R+\Delta V+\Delta P-\Delta L-\Delta T=\Delta WC$. What has been added in deriving equation (6) is a more specific expectation about the relationship between net income and operating cash flow. During a period in which income (plus depreciation and amortization expense) is increasing, operating cash flow normally will be less than income because the sum of the remaining variables on the right-hand side of equation (6) will be positive. During a period in which income (plus depreciation and amortization expense) is decreasing, operating cash flow normally will be greater than income because the sum of the remaining variables on the right-hand side of equation (1) will be negative. Combined with our earlier analysis, these expectations lead to a relatively comprehensive model of company behaviour: When income is increasing, operating cash flow will be low relative to income, but good growth opportunities will lead to additional investment and the need to obtain additional cash flow from financing activities. When income is decreasing, operating cash flow will be high relative to income but poor growth opportunities will limit investment and provide cash flow for financing activities (such as repayment of debt or repurchase of stock).

The relation between income and operating cash flow is an indicator both of the magnitude of company growth during a period and of its potential future growth. It is a basis for investors and other decision makers to form financial expectations about future operating performance. Because income and operating cash flow are artifacts of the accounting process, however, they are only two parts of a larger information set composed of related elements that include investing and financing activities. Therefore, it is the information set, in addition to its individual components, that is important.[6] Income and operating cash flow are summary elements that convey information about a company's activities. Relying on a single component of the system, such as income, to assess performance, or to form expectations of this performance, is inconsistent with accounting measurement (and with market behaviour, as described below).

The following hypothesis is derived from the relation between income and operating cash flow described above:

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[6] This study began as an examination of the relation between income and cash flow. The inspiration for such a focus came from the traditional assertions of accountants that income and cash flow are synonymous in the long-run, and that past earnings are better predictors of future cash flows than are past cash flows (e.g., FASB, 1978). In effect, however, this study is a test of an accounting measurement theory. Because the relation between income and cash flow encompasses all elements of the accrual accounting model, one cannot distinguish easily the importance of the income/cash-flow relation from the importance of changes in balance sheet numbers. Other academics have stressed the importance of examining relations among accounting variables and components of these variables (e.g., Lipe, 1986; Ou and Penman, 1989; Livnant and Zarowin, 1990; Ohlson and Penman, 1992; Lev and Thiagarajan, 1993). The importance of both accrual and cash-flow numbers has been recognized by the FASB as motivation for the reporting of cash-flow information (FASB, 1984).

H1: Companies reporting incomes[7] in excess of operating cash flow will exhibit higher growth in accounting measures of financing, investing and operating activities than those reporting cash flow in excess of income, assuming the incomes of both groups of companies are approximately equal.

This hypothesis suggests that, controlling for the level of reported income, companies generating income in excess of operating cash flow typically provide information about growth by means of other financing, investing and operating accounting measures.

EMPIRICAL ANALYSIS

The empirical portion of this article tests the hypothesis. Tests are based on an analysis of approximately 1,000 U.S. companies, using data from 1974–92. All companies on the annual industrial Compustat database were used for which complete data were available for each of the various time periods examined.[8] The number of companies varied depending on the time period. We examined periods of from one to ten years. Two ten-year periods (1975–84 and 1983–92) and three five-year periods (1978–82, 1983–87 and 1988–92), along with two-year and one-year periods, were included in the analysis. The first year for which data were available was 1974 (1993 Compustat file). Because one-year changes in some variables were required in the analysis, 1975 was the first year for which variables could be computed. The most recent year for which data were available was 1993. However, a large number of observations were missing in 1993. Therefore, we used 1992 as the final year for the analysis. Different time periods and numbers of years were used to test the sensitivity of the results. No important variations were observed in results across periods of different lengths.

The primary results summarized in this section are those for 1983–92. A ten-year period has the advantage of being long enough to wash out random variations that occur in shorter periods.[9] It has the disadvantage of being so long that structural changes in companies may create noise in the data, thereby reducing our ability to observe patterns of interest.[10] Nevertheless, the patterns we describe are relatively strong and consistent regardless of time period. The magnitudes of variables vary over time, but patterns are relatively stable.

Income was defined as income (after tax) before extraordinary items plus depreciation and amortization expense. Cash flow was operating cash flow (after tax) before extraordinary items. Both income and cash flow were divided by the beginning of period book value of ordinary shareholders' equity to scale for size differences across companies.[11] Similar (though slightly weaker) results were observed using total assets as the denominator. Book value rather than market value of equity was used to avoid potential confusion between results of the accounting process and those of market behaviour.

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[7] Adjustment for depreciation and amortization expense is assumed throughout the remainder of this article.

[8] Financial institutions were omitted. Electric and gas utilities were included, though the results do not change appreciably if they are excluded.

[9] One of the reasons posited by Easton *et al.* (1992) for the significance of their results concerning the earnings/market-return relation was the lower amount of measurement error in accounting numbers when computed over multiple years.

[10] Another result of using long periods is the typical survivorship bias problem. Results are generalizable only to the population of companies for which data were available on Compustat for the periods examined.

Sample companies were divided into groups by ranking companies by their income.[12] Companies were divided into six groups of approximately the same number of companies. Those with the lowest incomes were in Group 1, and those with the highest incomes were in Group 6. Companies in each group were then divided into two subgroups. One subgroup consisted of those for which income was greater than cash flow (labelled 1 *low* to 6 *low*, low cash groups) and the other consisted of those for which cash flow was greater than income (labelled 1 *high* to 6 *high*, high cash groups). For example, companies in the 1 *low* group were those with low income and income greater than cash flow, and companies in the 6 *high* group were those with high income and cash flow greater than income. The number of groups is arbitrary. Different numbers of groups were examined, and results were not overly sensitive to the choice of number.

Descriptive Analysis of the Income, Operating Cash-Flow Relation

Table 1 reports mean values for selected variables for companies in each group.[13] The number of companies in each group varies from 58 for Group 3 *high* to 101 for Group 3 *low*. Income is approximately the same for companies in the same group. Differences between income and operating cash flow are relatively large between *low* cash and *high* cash companies in the same group, however. Operating cash flow for the *high* cash-flow companies is approximately ten percentage points higher, on average, than that for *low* cash-flow companies in the same income groups. Because these differences are measured over a ten-year period, it is apparent that income and operating cash flow do not converge over time for a large number of companies. If accrual and cash-based measures are simply timing differences that wash out in normal operating cycles (see FASB, 1978), we should observe relatively minor differences between income and operating cash flow for periods as long as ten years. Instead, we find relatively large and persistent differences. As we will argue below, these differences are the outcomes of different performance and structural attributes of companies in these groups.[14]

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[11] Cash flow is income before extraordinary items adjusted for the effects of depreciation and amortization expense, gains and losses on sale of fixed assets, change in deferred taxes, equity in earnings, changes in current assets (except for cash and equivalents), and changes in current liabilities (except for debt). This procedure produces results that approximate, but are not equal to, those reported on the statement of cash flow. Drtina and Largay (1985) discuss difficulties in this estimation process. Our cash-flow estimates (c) were compared with cash flow (before extraordinary items) reported (r) for 1988–92 on the statement of cash flows. The Pearson correlation coefficient was 0.97. Percentiles of the absolute percentage difference [|(c–r)/r|] between our computed and actual reported numbers was: minimum 0.0, 10% 0.008, 25% 0.036, 50% 0.120, 75% 0.381, 90% 1.124, maximum 9.918.

[12] Income and cash flow throughout the remainder of this article refer to the measures scaled by equity described above.

[13] Outliers were identified for some variables that resulted in skewed data. Adjustments were made to reduce this problem by resetting the values of outliers to the third or ninety-seventh percentiles of the variable's distribution. This process is known as winsorizing and has been shown to be an effective method of dealing with outliers (Kennedy *et al.*, 1992).

Much of the difference between income and operating cash flow for companies in a group can be explained by changes in working capital, particularly changes in receivables, inventory and payables. Percentage changes in these accounts are consistently higher for the *low* cash companies than for the *high* cash companies within groups. These results are consistent with accrual accounting measurement as discussed in the previous section of this article. Though changes in payables offset changes in receivables and inventories, the changes in payables are not sufficient to fully compensate for the changes in receivables and inventories. Consequently, operating cash flows lag income for companies with high percentage changes in receivables and inventories.

The difference between income and operating cash flow is associated with company growth. Growth measures, such as percentage change in sales, total assets and shareholders' equity, are consistently larger for the *low* cash companies than for the *high* cash companies within groups. These results are consistent with the theoretical arguments presented earlier. The difference between accrual and cash-based measures provides information about company growth. This information is in addition to that provided by income alone. Though differences exist across groups, companies in high-income groups are growing faster than those in low-income groups, *low* cash companies are growing faster than *high* cash companies in the same group.

From Table 1, it is apparent that larger companies report higher income, on average, than smaller companies. Lower income and operating-cash-flow groups exhibit lower levels of total assets. Also, *high* cash-flow companies are larger than their *low* cash-flow counterparts for the same income levels, on average. The size effect is probably both structural and definitional. The fact that the largest companies are in Groups 4, 5 and 6 *high* is not coincidental. The size variables, along with other variables examined below, support the contention that the groups we have constructed differ as to the predominant types of companies that compose them. This aspect will be considered later. Definitionally, size results from the type of economic activities pursued over time. High-income, *high* cash-flow and high-growth companies become larger relative to their low-income, *low* cash-flow and low-growth counterparts. Thus, on average, we should expect that performance and size will be related.

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[14] Because groups can be characterized by companies' structural attributes, one might expect the income/cash-flow groups to be associated with particular industries. However, relatively little industry association is apparent. Companies in most industries were widely distributed across groups. Some concentrations were apparent. For example, companies in the oil extraction industry tend to be *high* cash companies, though their incomes vary from low to high. Companies in some industries tend to be more concentrated. For example, companies in the apparel industry tend to be low income and *low* cash flow. Companies in the printing industry tend to be either in high-income, *low* cash groups or in low-income, *high* cash groups. Most electric and gas utilities are in medium income groups, either *low* or *high* cash flow. Companies in the eating and drinking industry tend to be in the low-income, *high* cash-flow group.

None of the groups is heavily dominated by companies in a particular industry. Though groups are composed of certain types of companies, as described by structural variables, these companies fall into a variety of industries. The structural variables (such as size, debt/assets, divident payout, and capital intensity) are better descriptors of group composition than industry (using two-digit SIC numbers to identify industries).

TABLE 1

VARIABLE MEANS BY INCOME/OPERATING CASH-FLOW GROUP FOR 1983–92

	N		Income/equity		Cash flow/equity		%Δ receivables		%Δ inventory		%Δ payables	
Group	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
1	62	97	0.066	0.040	0.014	0.109	1.139	0.060	1.007	–0.180	0.878	0.465
2	86	73	0.147	0.147	0.088	0.190	1.769	0.392	1.519	0.093	1.825	0.729
3	101	58	0.191	0.194	0.147	0.232	1.806	0.971	1.553	0.462	1.707	1.099
4	72	87	0.231	0.229	0.183	0.271	1.937	0.753	1.433	0.485	1.762	0.844
5	70	88	0.263	0.263	0.204	0.298	2.450	0.769	2.050	0.507	2.237	0.966
6	65	93	0.361	0.348	0.317	0.395	1.897	1.225	1.746	0.665	1.859	1.263

	%Δ sales		%Δ assets		%Δ equity		Total assets		Debt/assets		Dividend payout	
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
1	0.856	0.148	0.987	0.080	1.012	–0.018	164	371	0.473	0.490	0.426	0.675
2	1.589	0.460	1.723	0.583	1.701	0.586	1,032	2,374	0.458	0.527	0.339	0.684
3	1.752	1.010	1.895	1.096	1.830	0.936	1,021	1,231	0.499	0.575	0.370	0.645
4	1.690	0.671	1.883	1.093	1.949	0.969	2,536	4,187	0.511	0.595	0.340	0.670
5	2.410	0.803	2.506	1.137	2.469	1.031	1,744	5,357	0.537	0.640	0.357	0.601
6	1.956	1.185	2.000	1.233	2.029	1.073	2,665	5,782	0.587	0.636	0.343	0.575

	Capital intensity		Invest. cash flow		Finan. cash flow		Market/book		Market returns	
	Low	High	Low	High	Low	High	Low	High	Low	High
1	0.333	0.420	–0.122	–0.122	0.033	0.001	1.486	1.427	0.479	–0.136
2	0.355	0.534	–0.123	–0.172	0.026	–0.018	1.461	1.262	0.928	0.726
3	0.423	0.660	–0.164	–0.232	0.021	–0.025	1.720	1.509	1.958	1.494
4	0.495	0.719	–0.187	–0.247	0.007	–0.023	1.922	1.678	2.206	1.867
5	0.529	0.749	–0.218	–0.258	–0.023	–0.028	2.361	1.612	2.984	2.168
6	0.562	0.699	–0.262	–0.305	–0.058	–0.067	3.214	2.468	5.276	3.011

Note. Low and High refer to low cash flow (income greater than cash flow) and high cash flow (cash flow greater than income) subgroups.

High-income companies are more highly financially levered than low-income companies, on average, as seen from the debt/assets ratio. Debt is defined as total assets minus ordinary shareholders' equity. The *high* cash-flow companies, on average, are more highly levered than their *low* cash-flow counterparts within the same group. Both results are logical because, respectively, higher income and operating cash flow can support higher levels of interest and principal payments. For example, *high* cash-flow companies with large debt leverage their operating results and increase shareholder returns.

Dividend payout tends to differ primarily between the *low* and *high* cash-flow companies in a particular group. The dividend payout ratios (ordinary dividends declared/income before extraordinary items) are considerably higher for the *high* cash-flow than for the *low* cash-flow companies across all groups. Dividend payouts are another sign of structural differences across companies. *Low* cash-flow companies are growing by reinvesting earnings and by issuing additional stock and debt. The growth reflects investment opportunities that require additional financial resources. *High* cash-flow companies appear to have fewer investment opportunities. The lack of good investment opportunities is consistent with lower growth and higher dividend payouts.[15]

Differences in investment opportunities also are apparent from the growth in sales, assets and equity. Though companies in Group 1 all report similar incomes, low cash companies are growing much more rapidly than *high* cash companies. Also, observe that growth is not necessarily higher for higher income relative to lower income companies. For example, growth is higher for companies in *low* cash companies in Group 5 than for those in Group 6, though income is nearly a third higher for Group 6 companies. Thus, income is only one dimension of financial performance. Alone, it not surprisingly provides only part of the information for forming future expectations about operating performance that is available through other elements of the accounting information set.

Also, it is apparent that the *low* cash-flow companies differ structurally from their *high* cash-flow counterparts. On average, *low* cash-flow companies are less capital intensive than *high* cash-flow companies in the same group, though high-income companies are more capital intensive than low-income companies. Capital intensity is measured by the ratio of non-current assets to total assets. By definition, capital intensive companies have large investments in fixed assets and generally are larger than less capital-intensive companies. A link between size, asset structure and capital structure is expected and confirms the structural difference across groups indicated by the size variable. A primary source of financing for fixed assets is long-term debt. Therefore, it is expected that large, capital-intensive companies would have high debt/asset ratios (see Myers, 1977).

Capital intensity can be a barrier to growth, however. Large amounts of investment typically are needed to construct or acquire new facilities. Large increases in customer demand are required to justify this additional investment without reducing existing accounting-return measures. Less capital-intensive companies generally are more flexible and are in competitive industries where new product markets provide good growth opportunities (see Bain, 1956; Smith and Watts, 1992).

Investing cash flow increases with income across groups. The *high* cash companies exhibited somewhat higher levels of cash outflow for investing activities, on average, than *low* cash companies in the same group. A component analysis of investing cash flow (not reported in Table 1) revealed that *high* cash-flow companies incurred higher capital expenditures, on average, across income groups, consistent with their higher levels of capital intensity. Acquisitions of other companies were higher for the *low* cash-flow companies, on average.

Financing cash flow consistently decreases as income and operating cash flow decrease and is lower for *high* operating cash-flow than for *low* operating-cash-flow companies in the same income group. This result is consistent with the expectation that *high* cash-flow companies generate more cash than is needed for available investment opportunities. These companies, therefore, use a larger portion of their operating cash flows to repay debt or repurchase stock. Though the differences between *low* and *high* cash-flow companies are consistent, the large amount of investing cash outflow relative to the small amount of financing cash outflow for *high* cash-flow companies raises the possibility that these companies are investing in presumably low-return projects rather than paying out excess cash to investors (see Kallapur, 1994, for further evidence).

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[15] Relations among growth, dividends, and investment opportunities have been described in previous research (e.g., Smith and Watts, 1992). Investment opportunities also are associated with accounting choices (Skinner, 1993).

The ratio of market-to-book value is consistent with the accounting variables. *Low* cash-flow companies have higher market-to-book values than *high* cash-flow companies in the same income group. This result suggests the market recognizes differences in expected value across companies, even when companies report the same amounts of income. This value is created by growth and growth opportunities. Information about growth is important to interpreting the role of income in valuation decisions.

Market returns, defined as the percentage change in common stock price, over the period of analysis also are consistent with market awareness of differential value across companies. High-income companies exhibit higher returns than low-income groups, consistent with the large body of literature that demonstrates a correlation between income and market returns. Of importance to this study, *low* cash-flow companies consistently demonstrate higher returns than *high* cash-flow companies for the same income groups. Thus, changes in market values are consistent with investor understanding of the higher growth rates of *low* cash companies relative to their *high* cash counterparts.

This section documented company attributes associated with the difference between income and operating cash flow. The associations are important for interpreting the information provided jointly by income and operating cash flow. These associations have not been examined in detail in earlier studies of the information provided by income relative to that provided by operating cash flow.

Statistical Tests of the Income, Operating Cash-Flow Relation

Table 2 summarizes statistical tests of the associations described in Table 1. Each of the variables in Table 1 was included in a regression model in which income and the difference between income and operating cash flow (both scaled by book value of equity) were included as independent variables. Thus the regression tests, whether income and operating cash flow, jointly provide information beyond that provided by income alone with respect to each of these variables. The regressions used data for individual companies rather than for the portfolios summarized in Table 1. Logarithmic transformation was used for total assets to correct for skewness.

The income/operating-cash-flow difference variable is significant at the .05 level in thirteen of the fourteen regressions provided in Table 2. It is significant at the .001 level in twelve of these regressions. Income is significant in all of the regressions at the .001 level. The signs of the regression coefficients are consistent with the patterns in Table 1. Therefore, it is apparent that income and operating cash flow jointly provide information about growth and growth opportunities in addition to that provided by income alone. These results provide evidence to support hypothesis H1.

The market-to-book value and market-return regressions also provide evidence that information provided jointly by income and operating cash flow is consistent with market behaviour. Market participants impound high growth (realized and expected) into stock prices. Consequently, high-income, *low* cash companies have higher market-to-book ratios and higher returns than high-income, *high* cash companies.

TABLE 2

REGRESSION STATISTICS FOR $Y=b_0 + b_1$ (INCOME/CASH FLOW) + b_2 INCOME
(p values below coefficients, N=952)

Y variables	b_0	b_1	b_2	Adj. R^2	F
%Δ receivables	0.764	8.446	2.400	0.240	150.613
	0.0001	0.0001	0.0001		
%Δ inventory	0.547	9.060	1.951	0.265	172.468
	0.0001	0.0001	0.0001		
%Δ payables	0.893	6.093	2.000	0.129	71.281
	0.0001	0.0001	0.0001		
%Δ sales	0.694	7.768	2.554	0.196	116.476
	0.0001	0.0001	0.0001		
%Δ total assets	0.723	7.691	3.039	0.252	161.224
	0.0001	0.0001	0.0001		
%Δ equity	0.735	8.858	2.729	0.213	129.027
	0.0001	0.0001	0.0001		
Total assets	4.362	–4.737	8.981	0.268	174.440
	0.0001	0.0001	0.0001		
Debt/assets	0.452	–0.391	0.435	0.109	58.853
	0.0001	0.0001	0.0001		
Dividend payout	0.831	–0.543	–1.527	0.025	12.201
	0.0001	0.228	0.0001		
Capital intensity	0.346	–1.092	0.930	0.296	200.025
	0.0001	0.0001	0.0001		
Investing cash flow	–0.067	0.370	–0.681	0.272	181.618
	0.0001	0.0001	0.0001		
Financing cash flow	0.048	–0.264	0.478	0.159	91.477
	0.0001	0.0001	0.0001		
Market value/book value	0.996	1.200	4.155	0.138	77.012
	0.0001	0.014	0.0001		
Market returns	–1.032	11.988	5.350	0.139	80.352
	0.0006	0.0001	0.0009		

Changes in the Income, Operating Cash-Flow Relation Over Time

The analysis presented above was based on a static description of companies over one ten-year period. We should expect, however, that the income/operating cash-flow relation to be dynamic. Companies change over time in response to changes in markets and to management decisions. In this section, we examine the pattern and frequency of group changes over time.

Patterns presented in Table 2 suggest attributes that are consistent with a life-cycle explanation of company growth, maturity and decline. However, this explanation is not directly applicable to the data presented. First, the data in Table 2 are cross-sectional. Thus, we are examining different companies during the same period, not the development of companies over time. Second, the data depicted in Table 2 identify different types of companies in different groups. These companies differ with respect to size, capital structure, asset structure and operating characteristics. They are not the same types of companies at different stages in their life cycles. Though companies change size over time, and can change other attributes as well, most companies do not go through stages of (a) small, not capital-intensive, and low-debt, to (b) large, capital-intensive, and high-debt, to (c) small, not-capital-intensive, and low-debt.

Nevertheless, in our classifications, companies change groups over time. The changes do not represent a cycle but also are not random. Table 3 provides information about changes among groups over three periods. Income and operating cash flow were measured for the five-year periods: 1978–82, 1983–87, and 1988–92. These were the three most recent five-year periods for which data were available. Five years were considered sufficiently long to establish a consistent income, operating cash-flow relation and still permit computation of group membership over multiple periods. Means were computed for each company for each of the five-year periods using the definitions provided earlier. Companies were classified by group using the procedures described for Table 1. Group locations were then compared for companies between the first and second five-year period and between the second and third five-year period. Table 3 reports averages for changes from the first through the third five-year period.

Approximately 25 per cent of the companies did not change income groups or *high*/*low* cash-flow subgroups between the first and second or between the second and third periods. Of those companies that changed income groups, approximately 35 per cent stayed in the same cash-flow groups (*low* or *high*) from the first to the second periods and from the second to the third periods. Most companies that changed income groups changed to the next highest or next lowest income group. Similar percentages of companies moved from the *low* to *high* cash groups as from the *high* to *low* cash groups. When companies changed cash-flow groups, the directions of movement to higher or lower income groups were not random, however. Accounting measurement theory suggests that, when a *low* cash-flow company becomes a *high* cash-flow company, it typically experiences a decrease or lower growth in income. Similarly, when a *high* cash-flow company becomes a *low* cash-flow company, it typically experiences an increase or higher growth in income. The data in Table 3 are consistent with these patterns. When *low* cash companies become *high* cash companies, approximately twice as many moved to a lower income group as to a higher income group. The percentages were similar for *high* cash companies that became *low* cash companies, but the income movement was in the opposite direction.[16]

The patterns revealed in Table 3 indicate that the financial performances of companies change over time. Income and cash flow are not stable for most companies. However, the changes are not indicative of a life-cycle phenomenon for the reasons stated above. Instead, the patterns suggest that about as many companies move to a higher income group as to a lower income group. Income and operating cash flow interact so that movements from *low* cash to *high* cash often are accompanied by a decrease in income, and movements from

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[16] The groups reported in Table 3 are not independent. The grouping procedure required that approximately the same number of companies be classified in each group. Once classified, the groups were split into high and low cash groups. Thus, the number of companies in group 1 *low* cash is not independent of the number in group 1 *high* cash, etc.

high cash to *low* cash are accompanied by an increase in income. Though a variety of patterns would be consistent with a life-cycle explanation (e.g., we should expect low-income, *low* cash companies to become high-income, *low* cash companies and for high-income, *high* cash companies to become low-income, *high* cash companies) none of these patterns is apparent.

If the relation between income and operating cash flow were stable over time, or if the pattern of change in the relation were predictable, the importance of the income/operating cash-flow relation would be diminished. In contrast, the results presented above suggest that the income/operating-cash-flow relation provides information (Tables 1 and 2) associated with growth and expected future performance. This relation changes over time, however, requiring continuous monitoring to assess changes in the magnitude and direction of expected performance.

DISCUSSION AND CONCLUSIONS

A purpose of financial accounting is to provide information useful for decisions that value companies (FASB, 1978). This is achieved by accounting portraying results of financing, investing and operating activities in terms of accrual and cash-based measures. Accounting provides a basis for evaluating these activities and for forming expectations about these activities in the future. In this analysis, income is meaningfully related to operating cash flow, with a difference between the two measures signalling the direction and magnitude of change in activities that create company value. In effect, most of the financial accounting information model is summarized in the difference between accrual and cash-based measures. Neither measure alone is capable of conveying this information.

Income provides an indicator of financial performance but is incapable of describing the full range of financing, investing and operating activities that permit a meaningful interpretation of income. In addition to income, it is important to assess investment opportunities. Companies with good investment opportunities can reinvest earnings to increase production and sales capacities. Additional financing is often needed to provide sufficient cash to take advantage of these opportunities. These companies are likely to produce higher future incomes and operating cash flows, thereby increasing shareholder value. Companies with similar incomes but poorer investment opportunities typically have excess operating cash flow that cannot be invested to earn higher future returns. The increase in shareholder value is lower for these companies than for those with good investment opportunities.

Results of this study confirm our expectations. Accounting numbers provide a coherent description of a company's financial performance and prospects when considered as a whole. Companies differ with respect to markets in which they operate. These differences are associated with different capital and asset structures that provide constraints in adjusting to changing economic conditions. Income and operating-cash-flow measures were used to group companies into categories descriptive of their financing and investing attributes. Low- (or high-) income companies may have good growth prospects resulting in high levels of financing and investing activities, indicative of improved future performance and value. Alternately, high- (or low-) income companies may have poor growth prospects resulting in low levels of financing and investing activities, indicative of deteriorating future

TABLE 3

PATTERNS OF COMPANY CHANGES AMONG INCOME/CASH FLOW GROUPS OVER TIME
(Percentages of companies)

	To	1		2		3		4		5		6		Total
From		Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	%
1	Low	**24.1**	27.7	11.7	10.2	10.2	5.8	5.1	1.5	0.7	0.7	0.7	1.5	100
	High	27.3	**37.4**	11.1	11.1	1.0	7.1	2.0	0.0	1.0	0.0	1.0	1.0	100
2	Low	8.1	16.2	**18.2**	11.5	14.2	14.9	4.7	8.8	1.4	1.4	0.7	0.0	100
	High	11.6	13.4	11.6	**22.3**	9.8	13.4	0.9	3.6	5.4	4.5	0.9	2.7	100
3	Low	6.6	7.2	10.2	12.7	**15.1**	11.4	15.1	6.0	9.6	3.6	2.4	0.0	100
	High	5.5	4.1	15.8	11.6	10.3	**19.9**	4.8	12.3	2.1	10.3	0.7	2.7	100
4	Low	5.9	5.2	7.2	59	6.5	8.5	**20.9**	8.5	15.7	5.9	7.8	2.0	100
	High	2.8	0.0	3.4	4.1	7.6	18.6	12.4	**20.7**	6.9	14.5	4.1	4.8	100
5	Low	0.5	6.6	3.0	4.6	4.1	4.6	9.6	5.6	**26.9**	11.7	17.8	5.1	100
	High	2.4	1.8	1.8	1.2	5.4	10.2	6.6	24.7	12.7	**17.5**	3.6	12.0	100
6	Low	0.5	4.7	0.0	2.6	1.0	2.6	5.2	4.2	16.7	8.3	**43.2**	10.9	100
	High	2.0	2.0	4.0	2.6	4.0	6.0	8.6	6.6	11.3	14.6	15.9	**22.5**	100

Note. Low and High refer to low cash flow (income greater than cash flow) and high cash flow (cash flow greater than income) subgroups. Numbers are the percentages of companies in a particular row. For example, in row 1 24.1 per cent of companies that were in the low-income, low cash-flow group in one period remained in that group in the next period; 27.7 per cent of the companies that were in the low-income/low-cash-flow group in one period changed to the low income, high-cash-flow group in the next period. Rows total to 100 per cent except for rounding. Three five-year periods were used in the analysis. Groups for 1978–82 were compared with 1983–87, and those for 1983–87 were compared with 1988–92. Cell numbers are average percentages for the two five-year period comparisons.

performance and value. Thus, the analysis here demonstrates why value depends both on where a company is at a particular time and on where it appears to be going. The magnitude of income and operating cash flow provide information about where a company is. The difference between these measures provides information about where it appears to be going.

As stated in the introduction, the basic aim of this article is to demonstrate how understanding of corporate financial performance requires access to both accrual and cash-based measures of operating activity. Thus this article seeks to specify an income/operating-cash-flow relationship that is linked to company performance. A principal incentive for undertaking such a task is to debunk the potentially misleading accounting myth that, over long periods of time, income and operating cash flow converge and that, consequently, earnings are a reasonable basis for predicting future cash flows.

The principal accounting measure identified for purposes of this study is the difference between a ten-year reporting of income and operating cash flow scaled to control for company size. Specifying this difference permitted companies to be classified into separate groupings depending on the persistence of the relationship—that is, between companies with income in excess of operating cash flow (*low* cash) and companies with operating cash flow in excess of income (*high* cash). We hypothesized that the former group of companies would evidence higher growth and market value than the latter group. Using data describing growth in accounting measures of financing, investing and operating activities, empirical results affirmed this hypothesis. Also observed was that, for many companies, income and operating cash flow do not converge in the long term.

More specifically, considerable differences were observed in the accounting characteristics of companies classified according to the income, operating-cash-flow relation over long periods of time. On average over a ten-year period, and compared with *low* cash companies, *high* cash companies were larger, more capital intensive and highly levered, more profitable, generated more operating cash flow, but had smaller market-to-book ratios. These companies also made greater dividend payouts and grew less with more limited investment opportunities.

These results imply that the financial condition of a company is described by the long-term accounting relation between income and operating cash flow. In particular, companies that persistently generate more income than operating cash flow tend to be smaller, have better investment opportunities, finance by means of equity, and retain rather than distribute most of their earnings. Conversely, companies that persistently generate more operating cash flow than income tend to be larger, have fewer investment opportunities, rely more on debt, and are likely to distribute rather than retain most of their earnings. These relations appear to be independent of a company's industry and are not indicative of a life-cycle effect in operating activity.

The value of a company depends both on where it is at a particular time (the magnitude of income and operating cash flow) and on where it appears to be going (the difference between income and operating cash flow). This is an important conclusion regarding the specific utility of reported accrual and cash-flow accounting measures. Previous research has concentrated on incremental rather than joint information provided by these measures.

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J. TABART-GAY AND P. W. WOLNIZER

Business Firms as Adaptive Entities: The Case of the Major Australian Banks 1983–94

The conventional accounting notion of 'going concern', that a firm will continue business operations in the same manner indefinitely, has influenced accounting thought and practice throughout this century. An alternative view, widely upheld in the literatures of economics and organizational behaviour, is that firms are generally innovative and adapt to changes in market and economic conditions. These conflicting ideas are put under inquiry by examining the business policies and practices of the four major Australian banks over the period 1983 to 1994. We conclude on analytical grounds that conventional cost allocation and deferral practices, being based on the static or conventional idea of a 'going concern', are flawed and yield balance sheets that are not indicative of the financial capacity of firms to engage in commerce at any time. We conclude on empirical grounds that the Australian banks, at least, are generally innovative and adaptive enterprises.

Key words: Adaptation; Banking; Banks; Financial reporting; Going concern.

The conventional accounting notion of 'going concern'—that business firms conduct their commercial affairs in essentially the same manner from year to year indefinitely—has influenced accounting thought and practice throughout the present century. This idea has been a rationale for the capitalization and allocation of costs, thereby underpinning many technical accounting practices which critics have claimed to be the source of misleading financial reporting. A different idea—that business firms are generally adaptive and innovative in anticipation of, or in response to, changing markets, economic conditions, government policies and technologies—has been widely upheld in the literatures of economics and organizational behaviour.

This study puts these conflicting ideas under inquiry by examining the business operations and policies of four major Australian banks over the period 1983–94; the ANZ Banking Group (ANZ), Commonwealth Bank of Australia (CBA), National Australia Bank (NAB) and Westpac Banking Corporation (WBC).

The period 1983–94 covers the era of substantial deregulation of the Australian financial system. Apart from being a period of unprecedented change in the Australian financial sector, it is also a period during which the Australian economy grew strongly before plummeting into a deep and sustained recession. Economic

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activity was robust until 1985–86, with GDP having increased by 5.7 per cent during 1984–85, the highest rate of growth in the Australian economy since the late 1960s. However, the economy slowed sharply in the second half of the 1980s; the balance of payments current account deficit soared to record levels; inflation approached 10 per cent; and interest rates rose dramatically as the Reserve Bank of Australia invoked tight monetary policy in response to the worsening balance of payments position, a vulnerable exchange rate and concerns about inflation. The Australian stock market crashed in October 1987, and over the next five years there were many spectacular corporate collapses—including the State Bank of Victoria, Farrow Corporation and its three building societies, and several major merchant banks.[1] By 1990–91, economic activity had slowed even further, accompanied by a sharp fall in inflation (to 3.4 per cent for the year ending June 1991), thus ushering in a period of modest growth, low inflation and low interest rates.

The impact of market and economic changes upon the aggregated reported financial positions and results of the listed Australian banks over the period 1982–94 is apparent in the appended tables that have been reproduced from the J. B Were & Son *Australian Research Report* (1994). The first table provides an aggregated financial summary for the major banks, while the second consolidates those data with those of the seven listed regional banks (including previous building society financial accounts)—Adelaide Bank Limited, Advance Bank Australia Limited, Bank of Melbourne Limited, Bank of Queensland Limited, Challenge Bank Limited, Metway Bank Limited and St George Bank Limited. 'In aggregate, the eleven listed banks represent approximately 79% of the Australian Banking Industry by total assets' (J. B. Were, 1994). Growth in net operating income for the banking sector grew from an annual increase of 11.8 per cent in 1983 to a peak of 24.4 per cent in 1988, before declining suddenly (to 14.3 per cent) in 1989 and subsequently to 3.2 per cent in 1994. Annual percentage changes in aggregate reported pre-tax profits fluctuated widely—from an increase of 43.5 per cent in 1984 to a decrease of 93.9 per cent in 1992 (over 1991); the reported increase in 1994 over 1993 being 54.8 per cent. Reported net profits grew at the rate of 6.2 per cent in 1983 to 46.1 per cent in 1989 (over 1988) before falling to an annual percentage decrease of 109.1 per cent during 1991–92. Aggregate net profits, before abnormal items, for the banking sector were $4,205 million in 1994, up 68.4 per cent from aggregate reported net profits of $2,497 million in 1993 and a $156 million aggregate net loss in 1992. Similarly, the (reported) asset growth over the period 1983–89 was strong and steady, rising to a high annual increase of 25.33 per cent in 1984, before falling to an annual growth level of 5.37 per cent in 1991, and subsequently to 1.96 per cent in 1994. The ratio of shareholders' funds to total assets across the banking sector, as reported, has slowly but steadily increased from 4.28 per cent in 1982 to 6.49 per cent in 1994. The pattern of reported earnings (and losses) and asset growth (and losses) is similar for the major banks.

Though commonly regarded as conservative organizations, and hence the kind most likely to exemplify the static (non-adaptive) accounting notion of a 'going concern', the

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[1] For a description and an analysis of several company failures during this period, see Sykes (1996), and Clarke *et al.* (1997).

TABLE 1

FOUR MAJOR AUSTRALIAN BANKS

Major bank summary		1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Net operating income	$M	4,856	5,411	6,476	7,751	9,019	10,790	13,349	15,175	17,036	18,430	18,862	19,428	19,833
	% change	n/a	11.4	19.7	19.7	16.4	19.6	23.7	13.7	12.3	8.2	2.3	3.0	2.1
Net interest margin	%	4.86	4.06	4.28	4.06	3.95	3.89	4.49	4.33	4.07	3.89	3.66	3.63	3.79
Provision for bad and doubtful debts	$M	195	275	244	327	598	974	1,073	1,510	3,098	4,081	6,491	3,063	1,576
	% change	n/a	41.4	–11.2	33.9	83.0	62.9	10.1	40.7	105.2	31.7	59.1	–52.8	–48.5
	% of loans	0.4	0.4	0.3	0.4	0.5	0.8	0.7	0.8	1.4	1.7	2.6	1.2	0.6
Pre-tax profit	$M	1,123	1,208	1,735	2,109	2,194	2,820	3,769	4,430	3,263	2,594	–80	3,859	5,996
	% change	n/a	7.6	43.6	21.6	4.0	28.5	33.7	17.5	–26.3	–20.5	–103.1	Large	55.4
Underlying earnings	$M	1,317	1,483	1,979	2,436	2,792	3,794	4,842	5,940	6,361	6,675	6,411	6,922	7,572
	% change	n/a	12.6	33.4	23.1	14.6	35.9	27.6	22.7	7.1	4.9	–4.0	8.0	9.4
Income tax rate	%	36.6	37.2	38.4	40.0	39.5	50.9	49.0	36.6	33.9	38.4	n/a	38.5	34.0
Net profit	$M	677	724	1,029	1,218	1,285	1,336	1,903	2,787	2,155	1,576	–307	2,240	3,789
	% change	n/a	7.1	42.0	18.4	5.5	4.0	42.4	46.5	–22.7	–26.9	–119.5	n/a	69.2
Dividends	$M	246	267	310	355	484	463	1,090	1,753	1,565	1,305	1,353	1,480	2,258
	% change	n/a	8.4	15.9	14.5	36.6	–4.4	135.4	60.8	–10.7	–16.6	3.6	9.4	52.6
Dividend payout ratio	%	36.4	36.9	30.1	29.1	37.7	34.7	57.3	62.9	72.6	82.8	n/a	66.1	59.6
Return on average equity	%	18.27	14.65	16.70	15.20	13.13	11.54	13.66	15.64	10.56	6.94	–1.24	8.85	14.25
Return on average assets	%	0.84	0.72	0.87	0.82	0.71	0.62	0.73	0.92	0.61	0.41	–0.08	0.54	0.93
Asset growth	%	n/a	11.80	25.81	20.89	22.82	13.89	19.99	21.16	11.39	4.96	4.60	2.27	–0.15
Gross non-accrual loans	$M	187	120	180	977	1,407	1,816	1,851	3,381	7,512	15,620	18,031	13,589	10,480
Gross non-accrual loans/gross loans	%	0.30	0.17	0.21	0.93	1.14	1.32	1.18	1.70	3.30	6.36	7.01	5.09	3.92
Total provisions/ gross n-a loans	%	345.0	629.3	635.7	139.1	126.3	108.4	123.5	83.4	58.0	41.8	56.7	60.1	63.3
Net non-accruals	$M	n/a	n/a	n/a	449	600	1,031	928	1,817	4,548	11,377	9,934	7,546	6,031
Net non-accruals/ gross loans	%	n/a	n/a	n/a	0.43	0.49	0.75	0.59	0.92	2.00	4.63	3.86	2.83	2.25
Non-interest exp./ net op. income	%	72.9	72.6	69.4	68.6	69.0	64.8	63.7	60.9	62.7	63.8	66.0	64.4	61.8
Non-interest exp./ average assets	%	4.40	3.89	3.79	3.56	3.45	3.23	3.27	3.07	3.02	3.06	3.10	3.02	3.02
Shareholders' funds/ total assets	%	4.33	4.32	5.22	5.44	5.18	5.47	5.98	5.77	5.78	6.28	6.11	6.20	6.64

Source. J. B. Were & Son, *Australian Research Report*, 1994

TABLE 2
ALL LISTED AUSTRALIAN BANKS

Banking sector summary		1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Net operating income	$M	5,051	5,646	6,764	8,068	9,403	11,286	14,043	16,057	18,038	19,632	20,216	20,991	21,657
	% change	n/a	11.8	19.8	19.3	16.5	20.0	24.4	14.3	12.3	8.8	3.0	3.8	3.2
Net interest margin	%	4.77	4.03	4.24	4.02	3.90	3.85	4.44	4.28	3.99	3.85	3.66	3.63	3.76
Provision for bad and doubtful debts	$M	195	276	245	327	601	985	1,092	1,551	3,146	4,232	6,695	3,212	1,639
	% change	n/a	41.9	–11.4	33.7	83.6	63.8	10.9	42.1	102.8	34.5	58.2	–52.0	–49.0
Pre-tax profit	$M	1,181	1,260	1,808	2,174	2,251	2,923	3,953	4,640	3,497	2,818	172	4,277	6,621
	% change	n/a	6.7	43.5	20.2	3.5	29.9	35.2	17.4	–24.6	–19.4	–93.9	Large	54.8
Underlying earnings	$M	1,376	1,536	2,053	2,501	2,852	3,908	5,045	6,191	6,642	7,051	6,866	7,489	8,260
	% change	n/a	11.7	33.6	21.8	14.0	37.0	29.1	22.7	7.3	6.1	–2.6	9.1	10.3
Income tax rate	%	36.9	37.5	38.7	40.1	39.2	50.6	48.9	36.6	34.1	38.0	n/a	38.4	33.8
Net profit	$M	709	753	1,068	1,256	1,326	1,395	2,000	2,923	2,304	1,727	–156	2,497	4,205
	% change	n/a	6.2	41.8	17.7	5.5	5.2	43.4	46.1	–21.2	–25.0	–109.1	Large	68.4
Dividends	$M	248	269	312	358	495	475	1,120	1,811	1,658	1,392	1,466	1,665	2,541
	% change	n/a	8.5	16.0	14.7	38.4	–3.9	135.5	61.7	–8.4	–16.1	5.3	13.6	52.6
Dividend payout ratio	%	34.9	35.7	29.2	28.5	37.3	34.1	56.0	62.0	72.0	80.6	n/a	66.7	60.4
Return on average equity	%	18.33	14.58	16.60	15.06	12.98	11.47	13.56	15.45	10.59	7.14	–0.59	9.17	14.58
Return on average assets	%	0.83	0.70	0.85	0.80	0.69	0.61	0.73	0.91	0.61	0.42	–0.04	0.56	0.93
Asset growth	%	n/a	12.08	25.33	20.86	23.14	14.05	20.05	21.84	11.38	5.37	5.31	3.68	1.96
Gross non-accrual loans	$M	n/a	n/a	n/a	977	1,407	1,816	1,851	3,393	7,650	15,978	18,615	14,236	10,934
Gross non-accrual loans/gross loans	%	n/a	n/a	n/a	0.87	1.07	1.23	1.09	1.57	3.09	5.99	6.59	4.78	3.56
Total provisions/ gross n-a loans	%	n/a	n/a	n/a	139.33	126.73	108.91	124.64	84.64	57.92	41.81	56.23	59.34	63.43
Net non-accruals	$M	n/a	n/a	n/a	449	600	1,031	928	1,807	4,651	11,629	10,333	8,001	6,310
Net non-accruals/ gross loans	%	n/a	n/a	n/a	0.40	0.46	0.70	0.55	0.84	1.88	4.36	3.66	2.69	2.06
Non-interest exp./ net op. income	%	72.77	72.79	69.65	69.00	69.67	65.38	64.08	61.44	63.18	64.09	66.04	64.32	61.86
Non-interest exp./ average assets	%	4.29	3.83	3.74	3.53	3.42	3.21	3.26	3.07	3.02	3.06	3.10	3.00	2.97
Shareholders' funds/ total assets	%	4.28	4.29	5.14	5.36	5.12	5.44	5.96	5.75	5.77	6.23	6.05	6.11	6.49

Source: J. B. Were & Son, *Australian Research Report*, 1994

Australian banks have actively pursued new business opportunities afforded by deregulation and the new communication and information technologies during the last decade. All have been innovative and enterprising in their pursuit of an increased share of financial services markets domestically and overseas, and in entering the markets for other than 'core' banking business. New business strategies have entailed changes to corporate policies, organizational structures and management arrangements. Innovation in financial product design and packaging, financial service delivery and non-core business developments have been aided and facilitated by advances in technology, organizational restructuring and the sale of so-called 'fixed assets' and business units. Far from exhibiting the static organizational behaviour envisaged in the conventional accounting notion of 'going concern', the banks have been quick to exploit business opportunities made possible by the new regulatory environment, technologies and globalization of financial markets. Their actions illustrate organizational flexibility, adaptability and capacity to innovate in commercial affairs. In stark contrast to the conventional accounting wisdom, WBC stated that it would 'consider the sale of any operation where the sale proceeds exceed the value that can be extracted by continued operation within the group' (1991 Annual Report, p. 7). And all four banks have done so frequently over the last decade.

FIRMS AS GOING CONCERNS—STATIC AND DYNAMIC NOTIONS

The conventional, static, accounting view of a firm as a going concern does not contemplate organizational change, innovation and adaptation as being essential to the maintenance of the financial capacity of firms to remain in business. Sterling (1968, pp. 481, 489) describes the conventional accounting notion of going concern as 'the accountants' firm model'—one that 'implicitly contains the conditions necessary for a firm in a stationary state', as against a firm that is a going concern in a volatile state. The presumptions that firms trade in more or less the same goods and services indefinitely, that their business policies and practices remain largely unchanged from year to year, and that they have indefinite lives underpin much of conventional accounting practice. Those presumptions ignore continual variations in the market (or price) system, economic conditions, technology and management practices. They do not accord with commercial reality, that firms must be responsive to changes in the market and economic environments if they are to remain in business—if they are to maintain or enhance their financial capacity to engage in commerce.

This idea of firms as static organizations has been repeated often in the accounting literature over the last century. Guthrie (1883, p. 7) stated that:

> Manufacturers and traders do not construct business premises or lay down special plant in the intent of a short period . . . the method of treatment for annual accounting is as of a 'going concern' . . . Matter and things fixed in a permanent working position must not be treated in accounts as following the fluctuations of the market, for it is not a trading item that is in question, such as stock in trade, which can be sold any day without interruption to works.

That business firms make long-term investments in property, plant and equipment with the intention of producing goods and services for which there will be sufficient demand to ensure that they remain solvent and profitable is not disputed. However, changes in technology, consumer tastes, economic and market conditions work against the idea that demand will exist indefinitely for those goods and services at a level that ensures the solvency and profitability of the firms that produce them.

Acknowledging that some firms become insolvent, Paton (1922/1962, p. 478) described the accounting idea of a firm as a going concern as 'largely one of convenience'. Elucidating the idea rather more fully, Vatter (1947, p. 5) argued that:

> The continuity convention involves a great deal more than mere extension of corporate existence . . . it includes assumptions such as: . . . that the operations reflected in the accounting statements will be continued in substantially the same terms as in the past . . . ; that the economic and technological factors which are relevant to the operations will continue to exert their influence in a substantially unaltered fashion; and that . . . there will be no change in the basic objectives, policies or strategic plans of the management.

Under the accounting going-concern convention, the intention of managers in acquiring durable goods for long-term production purposes, rather than for sale, is among the grounds given for spreading the costs of acquiring durable (and other intended long-term) assets over several accounting periods. That expectations, rather than dated financial facts, underpin the conventional definition of assets is made plain in SAC4 *Definition and Recognition of the Elements of Financial Statements* (AARF, 1995, paras. 12 and 14, emphasis added): 'Assets are *future* economic benefits controlled by the entity as a result of past transactions or other past events . . . *Future* economic benefits or service potential is the essence of assets'. The conventional notions of going concern and asset ignore the realities of the marketplace, of what generates the financial capacity of firms to remain in business. Consider, for example, the case of a prospective widget manufacturer. After undertaking informed market research and in anticipation of a sufficient demand for widgets to sustain a certain level of business operations, an entrepreneur invests a substantial amount of money (capital) in a widget-making machine—say $100,000. On the assumption that the machine has a useful life of (say) twenty years, that it will have no scrap value, and that it will contribute evenly throughout its life to the production of widgets, the entrepreneur's accountant calculates that $5,000 of the acquisition price should be allocated to sales revenue from widgets each year for the next twenty years. That advice is predicated on the conventional accounting notions of going concern and matching. Apart from the assumptions made about the useful life and productivity of the machine, the recommended accounting practice assumes that the market demand for widgets will continue to exist at a viable level for the next twenty years—every year 1/20th ($5,000) of the acquisition price of the machine, being that portion of the cost used up in the production of widgets that year, is to be allocated (or matched) with the revenue earned from selling widgets each year for the next twenty years. The accounting convention ignores the possibility that, for any reason or set of reasons, the market demand for widgets may change significantly or evaporate at any time.

Further, the $5,000 expense to be matched with sales revenue, being derived from expectations of the useful life and productivity of the machine, is devoid of commercial reality and arbitrary. For the same reason, the written-down value of the machine at the end of any year, not being a price, lacks a commercial referent and is not indicative of the extent to which the machine contributes to the financial means available to its owner for market action. The impact of the going concern convention on the annual balance sheet and income statement of the widget manufacturer will not inform the entrepreneur (or other interested parties) of the dated financial position and performance of the business.

While accountants may assume that firms are going concerns, the reality has been shown time and again to be otherwise—unless firms have sufficient financial resources to respond to changes in the markets for the goods and services they presently produce or render, or to enter and compete successfully in different or new markets. Indeed, 'it is far from true that all business enterprises have indefinitely long lives . . . the history of business risks and fatalities is such as to remind us more of death than immortality' Wilcox and Greer (1950, p. 493). And the most recent spate of corporate collapses in the English-speaking world during the late 1980s bears its own testimony to that fact. The intentions and expectations of managers are personal and speculative, but the financial consequences of changes in markets (the price system) are commercial and economic facts. The implication of the going concern convention is that accounting practice is predicated on the former, and ignores the latter: 'A profit-seeking undertaking using wasting assets is, and for accounting purposes must always be treated as, a going concern; and a going concern will apply its wasting assets to the purposes for which they were acquired, and will not act as a dealer in the purchase and sale of such property for profit' Leake (1948, pp. 2–3). While balance sheets are conventionally prepared 'for the purpose of showing to all concerned the financial condition of the business as a going concern' (Sanders *et al.*, 1938, p. 55), the actual financial capacity of the business to remain in business may be otherwise at the stated date.

The financial ability of the firm to engage in commerce, to buy and sell generally, is determined by the amount of money and money's worth of goods and rights in its possession less its debts. Cash flow is produced by selling (liquidating) goods and providing services. The dynamic idea of a going concern contemplates a firm whose managers, having up-to-date knowledge of the financial and all other resources at their disposal, pursue all feasible and appropriate market opportunities with a view ultimately to enhancing the financial position of the firm. For the widget manufacturer, that may mean continuing to produce widgets in essentially the same manner and quantity and selling them in the same market—for the time being. But it may also mean being innovative by producing better, more sophisticated, widgets; producing different models or differently packaged widgets and selling them in segmented markets; producing spare parts and providing maintenance services for widgets; finding off-shore markets for widgets; relocating some or all of the manufacturing process; selling land and buildings and buying or leasing different premises; selling or otherwise disposing of items of plant and buying different plant; contracting out or further automating the manufacturing process; diversifying business operations by producing different products and entering different markets; restructuring organizational and management arrangements; and, perhaps, winding down or getting out of the widget-making business altogether. In the words of

McCracken (1948, p. 28):

> the chief concern of the successful businessman is that of watching daily the moves of his competitors and the possible or prospective changes in mood or habit of prospective customers. Every new move made by a competitor or customer makes imperative some new move or considered adjustment in his own business to meet the new contingency.

That is the essence of economic behaviour in a market economy.[2] As argued by Schumpeter (1947, p. 82):

> Capitalism . . . is by nature a form or method of economic change and not only never is but never can be stationary . . . The fundamental impulse that sets and keeps the capitalist engine in motion comes from the new consumers' goods, the new methods of production or transportation, the new markets, the new forms of industrial organization that capitalist enterprise creates . . . [The] process of creative destruction is the essential fact about capitalism.

Adaptive or economic behaviour entails continuously monitoring the quantum and composition of the financial resources available and deploying those resources in response to, or anticipation of, changes in the price system. The market system is in a continuous state of flux because of changes in consumer preferences, economic conditions generally, government fiscal and monetary policies; participation by new entrants in existing markets; emergence of new markets; changes in economic conditions generally; technological innovation and advances; and so on. For those reasons 'successful management is continually modifying the composition of the capital in a company in attempting to increase the income potential in the face of changing tax situations, wages, product demand, technology, interest rates, and so on' (Trumbull, 1958, p. 28). Repeated failure to respond successfully to the unceasing fluctuations in the price system ultimately leads to financial collapse, because 'Profitability and survivability derive in the last analysis from adaptation to the marketplace' (Levinson, 1970, p. 143). And adaptation is that process of 'creative destruction' which transforms the composition of assets—irrespective of the intentions and expectations of managers when they were acquired—with a view to increasing their quantum and profitability.

Adaptive behaviour is inescapable for the going concern, and 'so long as the environment of the firm is unstable (and unpredictably unstable), the heart of the theory [of the behavior of the firm] must be the process of short run adaptive reactions' (Cyert and March, 1963, p. 100). Beer (1959, p. 17) expressed the same view: 'It is essential to the company that it develops techniques for survival in a changing environment: it must adapt itself to its economic, commercial, social and political surroundings, and it must learn from experience'. Consequently, 'the firm today is not the same firm as it was last year . . . Firms change their technologies, factor intensities, operating structures, financing mix, market penetration, product outputs, activity diversifications, and expansion policies' (Vickers, 1981, p. 174).

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[2] For a comprehensive elucidation of market action, or economic behaviour, see, von Mises (1949/1966). For an examination of the implications of the ideas of the Austrian school of economics, and especially of the Austrian theory of entrepreneurship, for financial reporting, see Young (1987).

While some references to this dynamic view of a firm as a going concern may be found in the accounting literature (e.g., Paton, 1917, p. 25; Pixley, 1926, Vol. 1, p. 520; Canning, 1931, p. 163; Edwards and Bell, 1961, p. 38), the implications of it for accounting practice have been substantially ignored except by Chambers (in several works, e.g., 1986, chapter 6, but especially and systematically in his principal exposition of CoCoA, 1966) and Sterling (e.g., 1979). Chambers (1966, p. 218) defined a going concern as 'a firm which adapts itself by the sale of its assets, short-term and durable, in the ordinary course of business; that is, a firm which is not in the process of forced liquidation'. Sterling (1979, p. 121) argued that:

> If the technology of production changes, an owned asset may have to be replaced with an unowned asset in order to meet the competition. If relative prices change, an owned asset may have to be replaced with an unowned asset in order to minimize costs, that is, to substitute one kind of capital for another kind or even substitute labor for capital. These decisions are not merely theoretical niceties. Firms regularly make such decisions since they must adapt to changing conditions.

Accepting this view of a going concern, both Chambers and Sterling concluded that it was logically sound and practically relevant to measure assets at their current market selling (exit) prices for the purpose of providing up-to-date information about the financial position of firms.

ADAPTATION AND INNOVATION IN BANKING

Prior to the substantial deregulation of the Australian finance industry in the early 1980s, the business operations of the Australian banks were constrained by regulations that covered interest rates paid on deposits and charged on loans, foreign exchange, asset composition (minimum number of Commonwealth Government Securities that had to be held), reserves to be deposited with the Reserve Bank, and so forth. Those and like regulations impeded the capacity of the banks to respond to commercial opportunities in the markets for financial services other than banking services.

During the period 1980–83, the ceiling on interest rates paid on bank deposits was removed, the Bank of New South Wales and the Commercial Bank of Australia merged to form the new Westpac Banking Corporation, the National Bank merged with the Commercial Banking Company of Sydney to become the National Australia Bank, a tender system for treasury bonds was introduced, the Australian dollar was floated, and most foreign exchange controls were abolished or relaxed. The distinction between trading banks and savings banks was abolished in 1988. During 1985–86 sixteen new banks were granted licences, and more than thirty new merchant banks commenced operations (Peat Marwick, Mitchell & Co, 1987, p. 1).

The annual reports of the major banks for the period 1983–94 reveal something of the significance and scope of their strategies for exploiting new market opportunities and gaining competitive advantage, and the actions taken within and outside their organizations to give effect to those strategies. Drawing upon that information, we show how, by changes in their business policies and practices, the banks have responded to changed market conditions and pursued new business opportunities in core and non-core banking operations.

Innovation in the Development and Provision of Financial Products and Services

Competition between banks and non-banking financial institutions within the financial services industry has spawned a multitude of different and differently packaged financial products, loan services and electronic banking services delivered in a variety of ways.

Financial products One of the many changes made by the banks in the area of financial products included repackaging personal loans. The NAB concentrated on providing flexibility to its customers and offered specific-purpose loans, home-improvement loans, car loans and multi-purpose loans during 1983–84. This was followed in 1985 by variable loans for housing finance, and during 1989–91 fixed-rate housing loans were included in the package. The CBA initially concentrated on loan protection insurance and then a loan facility for residential property investment. By 1994 the bank had focused on home-loan improvements and provided the Expanded Purpose Home Loan, a split-rate home loan (allowing fixed and variable rates) for increased flexibility, and an Investment Home Loan Product with fixed or variable rate alternatives. The ANZ took up the challenge and provided loans for residential investment properties as part of its new home-loan package during 1990–91. WBC increased competition in the residential market with a specific option called WBC Equity Access, an owner-occupied residential mortgage based line of credit.

The banks altered the image of customer savings and cheque accounts. The NAB produced the premium package cheque account which paid market interest rates and included benefits such as travel advantages, credit cards, finance and short-term deposits. Apparently in response to the 1987 stock-market crash and the subsequent increased demand for residential and commercial investment properties, the bank introduced a reward retirement package and a flexible mortgage account. A new cash management deposit account and mortgage trimmer plan were introduced by 1991. Term deposit accounts were given a boost by CBA during 1983–84, with Excel-A-Rate, which provided options for withdrawal of funds without penalty at three-month intervals, or an increasing interest rate if the term was continued. Following this initiative customers were provided with new short-term call accounts, settlement deposit trust accounts, a new statement savings account, and security plus investment accounts. Schools were a particular target market for CBA: the Dollarmite account was pitched at primary school students, while Club Australia was aimed at high schools. School leavers (eighteen to twenty-four years) were not forgotten. A new package called Essentials was developed especially for that age-group. ANZ offered its customers new deposit products and increased flexibility in relation to term deposits and interest-rate choice. In keeping with its competitors, the ANZ targeted specific groups as a strategy to increase business. Primary producers were given the option of a high interest at call Harvest Account and the under twenty-five-year-old group had the offer of Fast Forward. In addition, the ANZ provided a high-performance passbook, expanded its Access Account to include a cheque-issuing facility and daily interest calculations paid quarterly. WBC designed a package product for school leavers called Getting Started, and Altogether—a product to assist families with money management. The bank released its Advantage Saver Account as the principal deposit product, withdrew the traditional passbook account and introduced transaction charges.

Following the effective deregulation of the Australian credit-card industry on 1 August 1993, the NAB was the first major bank to announce a revamped range of card products. And the following year launched Flybuys (a card purchase benefit scheme) joint venture in conjunction with Coles Myer and Shell Australia. From the early years of deregulation plastic card-based products became familiar to customers of all banks. The CBA introduced Club Australia during 1983–84. The ANZ launched its Visa Premier Club the following year, and introduced a Visa credit charge cheque to improve Visa account access during 1987. Mastercard was introduced in 1991 as an alternative to Visa and around the same time ANZ established their bankcard as a debit and credit card account. WBC, in conjunction with American Express, issued the Goldcard in 1983 and developed an affiliation with Mastercard. CBA also developed an affinity Mastercard program, with the Spastic Centre of NSW in 1990, and introduced contemporaneously a Commonwealth Mastercard business card.

The activities of the NAB included development of factoring operations in both the domestic and international markets; and new products in the areas of equipment purchasing, working capital advances and inventory financing. During 1989–91, the CBA introduced rollover bonds and trade finance packages and, by 1994, had developed easier funding arrangements for successful applicants for Export Market Development Grants. The ANZ produced its Master Trust product, a complete investment system, and developed a superannuation pool for trustees and fund administrators. WBC had two new funds on offer by 1988, the WBC Real Property Growth Trust and Approved Deposit Fund. As stated in their 1988 Annual Report, 'WBC has moved progressively to offset, and then take advantage of, global developments in financial markets. In response to deregulation, the Group has grown rapidly beyond its traditional base to expand into new products and new markets'.

Loan services In response to the Commonwealth government's introduction of a First Home Owners Scheme, the CBA planned and expanded its home loan business in 1983 with a wide range of new services aimed at specific-interest groups. Introductory products offered to customers included the Home Seeker Loan and Home Improvement Loan. The following year a new Step-by-Step Home Loan was introduced and the bank increased its range of loan alternatives; twenty-five years repayable monthly (special repayments allowed), low-start loan, high-start facility, fixed interest loan > $100K (three-year fixed period), land loan, a three-yearly review option and a loan protection plan. In its 1984 Annual Report, the CBA stated that 'Deregulatory changes and technological innovation increased opportunities for the entrepreneurial banker'—opportunities which financial institutions within the Australian industry aggressively pursued.

All major banks moved in a variety of ways to improve customer loan services. The ANZ increased its facilities and concentrated on consumer needs by altering the organization's internal structure to improve service and form closer links between the bank and its customers. This also assisted management in identifying any potential problem accounts. By 1985 WBC responded to the general economic downturn and established a restrained credit policy for loan services. In the 1985 Annual Report, WBC stated the bank's policy was 'directed to the maintenance of high quality loan assets and a balanced portfolio to avoid undue exposure to any one country, region, industry, or company group'. The experience of the next few years casts doubt on this claim. During 1988–89 WBC introduced daily interest calculations on loans as an incentive for the prompt repayment of loans. This action was quickly followed by financial institutions across Australia. In 1992, as the country began to recover from the widespread economic slump, NAB reduced loan fees and introduced a recession-buster lending program.

Other major initiatives taken by the banks were in rural and international services on offer to customers. For instance, around 1985 WBC expanded its traditional trade financing activities into medium and long-term exports. By 1992, the NAB had changed rural banking facilities in Australia, introduced special winter crop funding for producers with sound long-term prospects, moved to improve their rural lending portfolio in general by expanding specialized rural finance management teams, increased staff training, and improved technical resources. In 1993 it had introduced (via Northern Bank Limited) a range of treasury-based deposit accounts in response to rising prices for British equities and government competition. In 1994, Clydesdale plc launched a new flexible repayment mortgage product; Northern Bank Ltd introduced Northern Ireland's first capped-rate business loan and launched a business investment account; and the NZ Bank emphasized product innovation and tailored home loans, tailored investment accounts, and capped-rate term loans for the business market.

Electronic banking services Over the last decade, the banks have developed and introduced an array of new, innovative and improved banking and other financial services. Technological innovations have included automatic teller machines (ATMs), electronic funds transfer at point of sale (EFTPOS), and interchange arrangements between banks and their agencies providing increased flexibility for both the bank and its customers on their preferred way of conducting financial transactions.

Between 1983 and 1991, the NAB increased the number of its ATMs at street-front (branch) locations from 209 to 772. Off-premise machines were also being installed at various railway stations and shopping centres. Over the same period, the number of ATMs operated by the CBA increased from 111 to 1,104. This was mainly achieved by growth through acquisition with the availability of 864 other ATMs and 300 Easy Banks that were State Bank of Victoria machines. By 1993, the CBA had increased customer access to 3,578 ATMs of which 1,283 were CBA outlets. By December 1984 the ANZ had 200 ATMs and increased this number by almost 100 in the next two years. An interchange agreement formed between the NAB and ANZ in 1986 resulted in 1,200 ATMs for customer use by 1987, available in at least 19,300 locations internationally via Visa system links. WBC contributed to the dynamics of this environment by increasing ATM numbers from 174 in 1983 to 745 by September

1988. During the following two years WBC provided 900 ATMs for customer use with additional ATM access via a link with the CBA.

Sales by electronic funds transfer rapidly became popular with customers. The NAB had 4,641 EFTPOS terminals installed across the country by 1991 and during 1992 expanded the system to add Target stores to existing links with Coles New World Supermarkets. The CBA introduced EFTPOS in October 1984 and by June 1987 had terminals in 5,500 retail outlets; 1,000 having been installed during the first year CBA introduced the system. The bank further expanded electronic services in 1987 with the introduction of POSCASH, the cash dispenser linked to the EFTPOS network. The following year CBA's EFTPOS team set up an electronic communications network for Caltex Oil. ANZ established a pilot EFTPOS system in Australia and New Zealand during 1983–84 and by the end of the following year the system was operational in around 900 branches. WBC easily maintained pace with the other banks and installed 1,022 EFTPOS terminals by 1985. During the next five years WBC had installed 4,300 terminals—2,530 having been established by 1988.

The banks' business procedures, products and capacity to improve customer service have continually changed with market demands. Technological advances during the past twelve years have been embraced by the banks, enabling them to improve both internal and external business operations. Since 1992 NAB has developed an *expert system-linked program* for processing lending proposals in Flexinet branches to hasten loan approvals, and launched Merchant Data Capture on a limited basis, an electronic authorization of credit-card transactions. The bank also provided a link to their IBM mainframe for personal computer users with OS2 operating systems, and Australian administrative centres were connected to a national private voice network. CBA established its Micro-Treasurer system during 1985–86 which enabled customers to use PCs for access to, and to process cash management information from, the bank's mainframe. Phonebank was introduced in April 1987 and the following November CBA implemented the Bank Interchange and Transfer System (BITS) which reduced paper transactions, a combined initiative between the major banks. A debit-card system and new generation keycard system were also introduced which allowed customers to link bank accounts. The bank expanded its foreign exchange capabilities to cater for increased customer demand with a twenty-four hour per day marketwatch service. In addition, an automated letter of credit and clean payment system was installed to reduce turnaround time for international trade associations.

Corporate Acquisitions, Sales and Non-Core Banking Operations

Through acquiring or establishing new businesses, the banks have greatly expanded their target markets domestically and internationally for banking and related financial services, and entered markets for non-core banking services, thus competing with non-banking companies in the provision of a wide range of financial and other non-core banking services. In some cases, the banks have subsequently sold those businesses, choosing to get out of particular (geographical) markets for banking services or markets for particular non-core banking services.

During the decade from 1983, each of the banks made forays into a variety of markets for non-core banking services; some subsequently withdrawing them. By non-core banking business, we mean those businesses other than a bank's retail and wholesale operations of providing financial services and products through the branch network. For example, WBC stated that: 'In addition to traditional banking, the Group's retail and wholesale banking activities include investment banking, stockbroking, development finance, investment management, general and life insurance, bullion dealing, trading in government securities and travel' (Annual Report, 1987). Further illustrating the adaptive behaviour of the banks is their diversification into the travel, stockbroking, merchant banking and insurance industries in particular.

Travel By 1984, the NAB had established an international network of sixty-three travel centres, expanded the network to sixty-nine by 1988, and rationalized the number to sixty-five by 1991. During 1984–85, the NAB wholesale travel subsidiary, Prima Holidays, expanded its business operations in Europe, Asia, America and China, thus changing the original structure of the firm, as well as altering its business operations to cater for a larger geographical area. The locations of those travel centres changed from time to time, with the NAB closing down poor performers and opening new centres in different locations. New technology enabled the bank to introduce a new interfaced reservations system during 1988–89, thereby improving its competitiveness by enhancing customer service. Following a strategic review of the bank's operations, it was decided in 1992 that the bank should get out of the travel business because it was outside core group activities. Consequently, Prima Holidays was sold in 1992, and the travel centres of National Australia Travel Ltd were relocated during 1993 in anticipation of the sale of that subsidiary. The assets of National Australia Travel Ltd were sold in July 1994 at a profit of $9 million.

Likewise, the CBA's travel subsidiary, TravelStrength Ltd, expanded operations during the same period. By 1987 it had thirty-seven travel locations nationwide, and by 1992 it was one of the ten largest travel retailers in Australia. During 1993, it introduced a state of the art reservations system and business increased by 5 per cent. However, in 1994 the bank negotiated the sale of TravelStrength Ltd as a going concern. Similarly, the ANZ expanded its travel operations through ANZ Travel during the 1980s, negotiating an association between ANZ Travel and Jetset Tours in 1985. However, that bank also left the travel business by selling ANZ Travel in 1990. WBC also sold its travel subsidiary, Westpac Travel, in 1990.

Stockbroking Investigating organizational change within the stockbroking industry in Australia following deregulation of financial markets, Aitken and Czernkowski (1991, p. 101) observed that

> several banks moved immediately to acquire the maximum ownership interest [in stockbrokers] permitted. Until 1 July 1987, this interest was limited to 50 per cent... within a year McCaughan Dyson Capel Cure Limited, A. C. Goode & Co., Ord Minnett Limited and Norths Ltd were wholly owned by the ANZ Banking Group, the National Australia Bank, Westpac Banking Corporation and the Bank of New Zealand respectively.

The NAB entered the stockbroking business in 1984 with the acquisition of 50 per cent of A. C. Goode & Co., a stockbroker having representation in all Australian states, London, New York and Geneva. The following year it developed a branch system of share trading via A. C. Goode & Co. and introduced new stockbroking-related services; individual share-market advice, portfolio planning, and corporate capital raisings. By 1986 the bank had introduced an electronic video text telebroking system. By the end of 1987, the bank had acquired 100 per cent of the shares of A. C. Goode & Co., and then closed it down during 1989–90.

Likewise, WBC expanded its stockbroking interests during 1987–88 by acquiring 100 per cent of the shares in Ord Minnett Group Ltd, an Australian stockbroker, and 100 per cent of Wepco Holding Co. Inc., a dealer in U.S. Government and Agency Securities, which later traded as Westpac Pollack Government Securities Inc. Shortly after, the business interests of Ord Minnett were extended to Tokyo and Hong Kong. However, WBC closed Westpac Pollack Inc. in 1990 and sold Ord Minnett Group Ltd in 1992, with effect from 30 June 1993.

The ANZ's stockbroking interests increased in 1984 with the acquisition of 50 per cent of McCaughan Dyson Co. Ltd, a stockbroking firm. In 1986 it purchased the remaining shares in Capel-Cure Myers, merchant bankers, and by 1987 had acquired the remaining shares in McCaughan Dyson Co. Ltd. During 1987, the bank merged McCaughan Dyson & Co. Ltd and the U.K. operation of Capel-Cure Myers. The ANZ increased its share of the stockbroking market in Sydney by acquiring Morgan Grenfell Securities in 1989, launching Australian Futures Fund in the same year. During 1988, the ANZ merged its merchant banking and stockbroking operations into ANZ McCaughan Ltd and sold Capel-Cure Myers International Asset Management Division. However, in 1991 the bank radically downsized ANZ McCaughan Ltd and sold its stockholding in General Finance & Securities company in Thailand. The CBA had fewer stockbroking interests, but nonetheless formed the Corporate Placements Section in Treasury for broking activities in 1984, launched a TeleBroking service for investors, and established the Capital Markets Group for clients in the debt securities market in 1986.

Merchant and other non-core banking finance operations During the period under review, each of the four banks made extensive forays into merchant and other non-core banking activities.

The NAB expanded its merchant banking and finance operations through First National Limited, National Australia Fund Management, Custom Credit and National Australia Finance Ltd (formerly Beneficial Finance Ltd which it acquired in 1985). In 1984, it acquired a 50 per cent shareholding in Chase-NBA Group Ltd and Chase NBA Securities Ltd, and in 1987 acquired a 74 per cent interest in a New Zealand finance house from the Government Life Insurance Corporation. In 1985, the NAB sold the merchant bank Commercial Continental Ltd and floated the merchant bank First National Resources Trust for public investment. In 1986 it opened a Treasury Division specialising in foreign exchange and money market operations and launched National Australia Fund Management which specialized in trust management. During that year, the NAB grouped non-core activities under the

Retail Finance Services Division which included insurance, travel and finance; and launched the finance group Custom Credit and Custom Fleet which specialized in fleet leasing. In 1987 it created National Australia Merchant Bank (Singapore) Ltd; restructured Custom Credit into four groups — consumer, dealer, commercial and property financial services; and established the National Australia Financial Planning Group. The following year it launched National Australia Limited to provide financial solutions to corporate clients, and established National Australia Business Equity Consultants Ltd to assist corporate clients in the trading of subsidiary companies. In 1989 it established National Australia Trustees Ltd in Victoria, expanding that business to interstate in 1991 as well as expanding National Australia Financial Management to gain corporate superannuation market share. During 1991, Custom Credit withdrew from consumer and dealer financing in order to reduce losses; it ceased to write new business in 1992. Custom Credit was fully liquidated in 1994 along with National Australia Limited, First National Limited and First National Finance Limited.

The story at WBC has been similar. Through the early–mid 1980s the bank expanded its merchant banking and non-core bank financing operations, only to wind them down significantly during the early–mid 1990s. In 1983 it acquired Business Loans and Equity Capital Ltd and Myer Videonet Pty Ltd, but sold Budget Rental Operators Pty Ltd and Videotape and Film Services (Sth Pacific) Ltd. During 1985 it acquired the remaining shares in Partnership Pacific Ltd, established Westpac Real Property Growth Trust and acquired International Business Analysis Pty Ltd. The following year, WBC co-established the Merchant Bank of Fiji Ltd. The changed nature of banking operations is further illustrated by the reduction of conventional branches by 30 per cent and the opening of new investment centres and business centres in 1987. Expansion into non-core banking finance continued with the acquisition of Fitzroy Finance Group Ltd, Equiticorp Finance Group Ltd, and Standard Chartered Finance Ltd during the 1989–90 period. Previously, in 1988–89, the bank changed its merchant banking operations due to financial losses and changes in economic conditions by absorbing Partnership Pacific Ltd and Westpac Merchant Finance. In 1993 WBC sold its interests in ANZ Bank, Challenge Bank, Bank of Melbourne, Mase Westpac Group, and commenced the sale of Westpac/AGC finance subsidiaries. In 1994 AGC withdrew entirely from the commercial property market.

The CBA expanded its merchant banking operations during 1989 by increasing its shareholding in Australian European Finance Corporation Ltd from 51 per cent (purchased in 1984) to 100 per cent by acquiring the remaining 49 per cent of the shares from the Banque Nationale de Paris, Banca Nazionale Del Lavoro and Dresdner Bank A.G. The operations of AEFC Ltd were subsequently fully integrated within the CBA banking group. Other significant inroads in merchant banking were made via the acquisition of a substantial shareholding in Resources and Investment Finance Ltd (PNG) in 1987; the formation of an Institutional Banking Division to manage corporate, international, treasury and capital markets in 1990; and the merging of the Australian European Finance Corporation Ltd with the Institutional Banking Division in 1990. In 1994, the CBA separated business banking from institutional banking to better focus client relationships. Other non-core banking developments included the acquisition of an interest in First Management and Investment Company Ltd (in 1984), the widening of the charter of the Commonwealth Development Bank (in 1986) to allow equity financing, and the offering of fleet leasing and retail lease management via the Commonwealth Bank Finance Co. (in 1989 and 1992 respectively).

The ANZ also had significant merchant banking interests—in London, through ANZ Merchant Bank Ltd (1986), and in Australia through ANZ Capital Markets Corporation Ltd. Non-core banking finance business was expanded through such acquisitions as the highly diversified international Grindlays Banking Group (1983–84), Development Finance Corporation Ltd (1983–84), Australian Fixed Trust Ltd (1983–84), UDC Endeavour Building Society NZ (1985), Clark Equipment Credit Australia Ltd (a specialist capital equipment financier, 1988–89), and New Zealand and Mercantile Credits Ltd (1988–89).

General and life insurance During the period under review, all of the major banks diversified their business interests by establishing, buying and selling insurance businesses. For example, the NAB sold National & General Insurance Co. (UK) Ltd (1984); established a life insurance subsidiary National Australia Life Ltd (1985); sold its interest in Lease Underwriting (1985); and sold National & General Insurance Co. Ltd (1986). The company subsequently lost worker's compensation business in Victoria and voluntarily withdrew from that line of business in New South Wales. Through National Australia Life Ltd, the NAB introduced personal loan life insurance (1986) and began to offer annuity, investment and superannuation bonds (1987).

The WBC entered and exited the insurance business via Westpac Life Ltd—established in 1987 and sold in 1991. Through its insurance business Commonwealth Life Ltd, the CBA launched loan protection insurance in 1986, insurance bonds in 1987 and the Commonwealth Credit Card and Insurance Plan 1990. The ANZ acquired Greater Pacific Life Assurance Co. in 1986 and launched a new product, the crisis benefit scheme, through that company in 1987.

International Expansion and Contraction

Not only have the banks been innovative in their use of technology, packaging of financial services and products, the development of non-core banking businesses, but many of those activities have taken place in the contexts of international expansion or organizational restructuring. Examples of international and organizational developments have been alluded to above. While not exhaustive, additional examples of strategies embarked upon by the banks to increase their penetration of overseas financial markets further illustrate the extent to which each of the banks has continuously adapted or anticipated market and economic conditions.

The international expansion of the banks has been global. The NAB has established branches in the U.S.A. and throughout Europe and the Asia–Pacific region. Major acquisitions have included Chase-NBA Group Ltd and Chase-NBA Securities Ltd (1984) in the U.S.A.; Broadbank Corp. Ltd (1987) and the Bank of New Zealand (1992) in N.Z.; Clydesdale Bank plc (1987) and Yorkshire Bank plc

(1990) in the U.K.; and Northern Bank Ltd (1987) in Ireland. In 1985 the NAB sold its interest in Australia–Japan International Finance Ltd, Hong Kong; in 1991 it closed five branches in the U.S.A.; in 1993 it sold the Bank of South Pacific and merged the National Australia Bank (NZ) with the Bank of New Zealand; and during 1994 it completed an extensive restructuring of its U.K. and Irish subsidiaries.

The WBC also established an extensive international branch network, including branch offices of AGC off-shore. In 1985 it agreed to manage the Bank of Kiribati and co-formed Financial Security Assurance Inc. to underwrite corporate guarantees in North America. Expansion in the U.K. was enhanced by the acquisition of interests in Johnson Matthey Bankers Ltd and the opening of new foreign-exchange dealing rooms in the U.K. in 1986. Major activities in the Asia–Pacific region have included the management of the new Bank of Kiribati (1985), establishment of AGC Finance (Solomon Islands) Ltd (1986), acquisition of the South Pacific operations of the Hong Kong and Shanghai Banking Corporation and the Cook Island operations of Europeanpacific Banking Co. Ltd (1988), establishment of AGC (Taiwan) Ltd (1989), co-formation of PT Westpac Panin Bank in Indonesia and the acquisition of the New Caledonian operations of Banque Indosuez and the N.Z. securities firm Ord O'Connor Grieve Ltd (1990). However, the WBC later divested itself of several business interests off-shore: it withdrew from the U.K. property market, closed its Frankfurt office and sold U.K. residential mortgage service (in 1991); closed its Paris branch in 1992, after having only opened it in 1990; during 1993 it sold some Seoul interests, commenced the sale of PT Westpac Panin Bank in Indonesia and a variety of businesses in Thailand, Taiwan, Hong Kong, Singapore, Malaysia and Indonesia; and, in 1994, it sold AGC Asian operations.

The international acquisition and sale activities of the CBA, however, appear to have been less extensive and volatile. A global branch network was developed over the period under review, and expansion of treasury operations took place in the U.K., New York and Tokyo (1986). In 1989, it acquired the ASB Bank Ltd in New Zealand.

The ANZ undertook a vigorous program of global activities in addition to the aggressive expansion of its international branch network. The bank acquired Grindlay's Bank Group in the U.K. (1984), and subsequently merged the activities of Grindlay's with those of the ANZ—the program commenced in 1985 with joint activities in Canada, U.S.A., Japan and Europe; and also in Brazil, Spain and Iran (1986). Other apparently significant corporate acquisitions and formations include: Daiwa-ANZ International (Japan) (1985), Permanent Investment Building Society of Canterbury (NZ) (1985), 50% share of Metropolitan Life Assurance Co. of NZ Ltd (1985, but sold in 1987), Fijian and Vanuatuan operations of Barclays Bank plc (1985), remaining shares in ANZ Banking Group (NZ) Ltd (1986), ANZ Finance Ltd in U.K. (dealing with hire purchase, industrial/commercial leasing and business loans, but sold in 1987), ANZ International Ltd in Singapore (1987), ANZ Securities (Switzerland) Ltd (1988), PostBank in NZ (1989, but closed forty-three PostBank branches in 1991 after centralizing the N.Z. 'back office' processing functions, and another fifty-seven ANZ/PostBank branches in 1992), Fijian and PNG operations of Lloyd's Bank (1990), National Mutual Bank of NZ Ltd (1990), Olec Trustee Ltd in the Jersey (Channel) Islands (1991), and a share in the Indonesian PT Westpac Panin Bank (1993).

During 1989 to the mid-1990s, the ANZ divested itself of several major corporate interests, and downsized its operations internationally. It sold Melanesia International Trust Co. Ltd (1989); Grindlays Bank SA in France (1990); closed some overseas offices of ANZ McCaughan, merchant banking operation (1990); and sold all African operations (1992). During 1991–94 it closed the Zurich branch and offices in Italy and Spain (1991), closed offices in Texas and Chicago, concentrating all U.S. 'back office' clearing operations in New York (1992), and commenced closing the Canadian subsidiary (1992), while opening offices and/or branches in Hanoi and Ho Chi Minh City (Vietnam), Tonga and Guangzhou (China) (1993), and in Shanghai (China), Mexico and Sri Lanka (1994).

Write-Downs of Property and Loan Portfolios

Another aspect of the adaptive regime of the banks to changed market conditions during the early to mid-1990s has been their sale and write-down of investment and property portfolios, having regard to their resale value. KPMG Peat Marwick (1993, p. 7) stated that: '1992 might . . . be remembered as the year the banks went "to market to market" . . . reflecting the decline in asset values; for investments, for loan security and for the banks' own premises'. Write-offs against the asset revaluation reserves of the four major banks totalled $229 million in 1991 and $1,307 million in 1992, including a write-down of investments of $410 million. During 1992, they also wrote off a total of $6,490 million against their profit before tax for bad and doubtful debts (KPMG Peat Marwick, 1993, p. 1).

In 1986, the NAB built $87 million worth of property and sold $19 million worth of property. The following year the bank constructed a further $77 million of property and sold $24 million worth. WBC commenced selling excess bank freehold property during 1983, selling a substantial $113 million of freehold properties in 1989—the year property values decreased by $9 million. In 1991 the bank established a team to manage major property development and financing. During 1992, 110 property sales were finalized to the amount of $350 million. That year WBC properties were revalued and a provision made for property exposure of $2.2 billion. During the next year the bank sold property of $1.1 billion with a $14 million write-back to provisions.

The CBA revalued property holdings to market value during 1984 and initiated a program of sale and lease back arrangements in 1989. The bank continued to monitor and aggressively manage the property portfolio. And in 1993 it revalued property holdings to current market value and, when deemed necessary, to 'forced sale price' (Annual Report, p. 19). The ANZ revalued bank properties in 1983, estimating current market value of the estate to be $185 million greater than its recorded book value. Properties were revalued at directors' valuation or, if in excess of $1.5 million, by independent valuation. In 1992, the bank obtained independent valuations of 750 Australian and overseas properties thought to be worth more than $1 million. All of the banks continue to undertake regular valuations of their property portfolios.

Valuations during the early 1990s resulted in extensive sales of so-called 'impaired assets' and substantial write-downs of asset values carried in bank balance sheets. For example, in 1992 the NAB wrote down the value of its commercial property portfolio by $357.4 million, having regard to current market values with the basis of this valuation defined as 'a fully informed buyer and a willing but not forced seller and for no improvements in market conditions' (1992 Annual Report, p. 42). Likewise, the CBA defines the current market value basis of valuation as 'the amount which a property might be expected to bring in the open market at the date of valuation, if offered for sale on reasonable terms and conditions assuming a fully informed vendor and purchaser both willing, but not anxious, to trade . . . Revaluations are carried out as necessary and reflect "forced sale" conditions where appropriate' (Annual Report, 1992, p. 19). The ANZ indicated that 'the valuers were instructed to value on the basis of putting the property to market and achieving a sale within two years . . . It means that management has the flexibility to dispose of those properties quickly, if circumstances dictate that is the best course of action for the Bank and its customers . . . [A]n orderly disposal in a rational fashion will be our strategy' (Annual Report, 1992, p. 5).

CONCLUSION

The idea that business firms, as 'going concerns', are static rather than adaptive entities has become entrenched in accounting wisdom and practice during the twentieth century. It is the rationalization for the allocation and deferral of costs, and the matching of costs and revenues in the calculation of a periodic profit.

In the literatures of economics and organizational behaviour, however, business firms are held to be dynamic or adaptive entities. This article put these two ideas under test by examining the organizational arrangements, business policies and practices of the four major Australian banks during the period 1983–94. By recourse to their annual reports, evidence is adduced to support the proposition that those banks, at least, have conducted their commercial affairs in a manner consistent with the descriptions of adaptive enterprises. All have undergone significant organizational change; have generally been innovative and enterprising in the development of new financial products and services, and in the use of modern technologies in the delivery of those products and services to customers; have entered, and in many cases subsequently withdrawn from, new business ventures and markets; and have sold segments of their businesses and other so-called 'fixed assets'. In the decade following significant deregulation of the Australian financial system, the banks have responded to, and anticipated changes in, the economic environment and market opportunities within and beyond Australia: they initiated different trading strategies to define and secure niche markets and to seek competitive advantage on a national and international scale. Their behaviour has been inconsistent with the conventional accounting notion of a 'going concern'.

At any time, the fortunes of business firms are dependent upon their financial capacity to cope with, or adapt to, changes in the economic, regulatory and competitive environments that define at any time the domain within which business is conducted. New firms emerge within growth industries; old firms exit industries due to increased competition or other trade-related circumstances that diminish their financial capacity to survive. And many firms fail, for a variety of reasons. At any time, the financial capacity of a firm to engage in commerce is determined by the net amount of money or money's worth it commands: that is its dated financial position within the price or market system. It may be determined by reference to the up-to-date selling prices of its assets and its contractual debts from time to time. That determines the financial ability of a firm to pay its debts when due (to remain solvent), to engage in commerce generally, to exploit business opportunities as they arise, and to withdraw from business ventures when the circumstances demand it. Factual and up-to-date knowledge of the financial position and performance of business firms is essential to their financial administration.

While no general conclusions covering all industries and trades can be drawn from this study, it is apparent that the economic behaviour of banks is consistent with the dynamic or adaptive notion of a business firm. While banks are generally considered to be conservative organizations, and hence ones that might reasonably be expected to exemplify the accounting (static) notion of 'going concern', studies of other firms in other industries would deepen our understanding of the nature of business firms and hence provide the foundations needed to develop a more appropriate style of financial reporting.

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An Investigation of Audit Committees' Oversight Responsibilities

Audit committee performance has come under close scrutiny in recent years from a variety of policy-makers, interest groups and researchers. In particular, the adequacy of audit committee oversight has been challenged. At the same time, audit committees are under pressure to increase the scope of their oversight work. This study examines audit committee oversight from the internal perspective of active U.S. audit committee members. A two-part survey used Wolnizer's (1995) list of seventeen prescribed audit committee objectives related to accounting and reporting, auditors and auditing, and corporate governance in general as a basis to assess audit committee members' abilities to recognize their assigned objectives and explore their perceptions of the key tasks and issues currently addressed by audit committees. The results indicate that audit committee members appreciate the importance of all audit committee members having sufficient expertise in oversight areas related to accounting, auditing and the law. However, some respondents agreed they lacked sufficient expertise in many or all of these areas. In addition, the findings indicate that audit committee members tend not to recognize their assigned responsibilities, but agree with the proposed expansion of committee responsibilities. Using a multimethod approach, internal control evaluation was consistently listed and ranked as the most important oversight responsibility. These findings provide insight into the priority perceived by audit committee members as to their oversight responsibilities, and the adequacy of U.S. reporting disclosures as signals of audit committee work.

Key words: Audit committees; Objectives; Responsibilities; Surveys.

Audit committees assume the important responsibility of representing boards of directors on oversight matters related to financial reporting, auditing and overall corporate governance. As a corporate governance mechanism, audit committees monitor management, the external auditor and the internal auditor in an effort to protect shareholders' interests. Uncertainty about audit committee oversight reinforces the need to examine the scope and nature of work being done by audit

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committees. In particular, concerns persist about the scope of audit committee responsibility, critical oversight areas and the extent that audit committee members should be held accountable as monitors of accounting, auditing and other corporate governance activities (e.g., Treadway Commission, 1987; Macdonald Commission, 1988; General Accounting Office [GAO], 1991; Abdolmohammadi and Levy, 1992; Cadbury Committee, 1992; Wolnizer, 1993, 1995; Committee of Sponsoring Organizations of the Treadway Commission [COSO], 1994; Public Oversight Board of the SEC Practise Section [POB], 1994).

This work contributes to a better understanding of audit committee oversight by evaluating U.S. audit committee members' perceptions of their assigned oversight responsibilities and of audit committee oversight in general. In particular, a primary objective of this study is to provide a bridge from Wolnizer's (1995) synthesis and prescription of audit committee objectives to empirical evaluation of perceptions of practising audit committee members. Evaluating audit committee members' perceptions of their oversight work is important because of the ever-increasing risks and costs of liability assumed by directors in the U.S. (and elsewhere), where audit committee are, in large part, required for publicly traded companies. An examination of audit committee oversight in the U.S. provides useful information for countries operating in voluntary audit committee environments and considering regulatory change. An empirical assessment of prescribed oversight duties also is a relevant stimulant for future inquiry.

A survey was developed consisting of descriptive and exploratory components. The descriptive component of the study used Wolnizer's (1995) prescribed set of audit committee objectives to measure audit committee members': (a) abilities to recognize their assigned committee responsibilities; (b) opinions about the importance of having sufficient expertise in oversight areas such as accounting and auditing; (c) self-assessments of expertise in oversight areas; and (d) attitudes toward expanding the scope of audit committee responsibilities. The exploratory component collected audit committee members' perceptions of the key issues and challenges addressed by their committees, including what they believed were the most important oversight areas.

Previous examination and discussion of audit committee oversight have been based primarily from sources external to the corporate governance mechanism. Specifically, oversight responsibilities have been discussed in detail by policy-makers (e.g., Treadway Commission, 1987; Macdonald Commission, 1988; GAO, 1991; Cadbury Committee, 1992; COSO, 1994); researchers (e.g., Abdolmohammadi and Levy, 1992; Wolnizer, 1993, 1995); and other interest groups (e.g., Bacon, 1988, 1993; POB, 1993, 1994; Price Waterhouse, 1993). For example, Wolnizer (1995) synthesized existing lists of purported objectives by providing a set of seventeen oversight objectives that audit committees should consider in their effort to provide vigilant oversight. However, little is known about what oversight duties audit committee members perceive as critical in their work.

Abdolmohammadi and Levy (1992) provided some insight by accumulating a list of major oversight responsibilities provided by audit committee members. This study in part extends Abdolmohammadi and Levy by providing statistical analyses of audit committee members' perceptions of critical oversight responsibilities prescribed in the normative literature (e.g., Wolnizer, 1993, 1995). This study also provides information about the accuracy and completeness of audit committee duties listed in proxy statements, as well as normative insight into what responsibilities audit committee members believe their committees should be assuming. Work of this nature is important because 'directors who serve on audit committees are becoming concerned about the extent of responsibilities assigned to them' (Rezaee and Farmer, 1994, p. 19).

The results indicate that many audit committee members believe they lack sufficient expertise in oversight areas related to accounting, auditing and the law. This finding is consistent with the findings of Rittenberg and Nair (1993a). However, the respondents agreed that all audit committee members should have sufficient expertise in these three primary oversight areas and that expansion of committee responsibilities was merited. In addition, the findings indicate that audit committee members tend not to recognize their responsibilities as assigned in proxy statements, but perform many functions not listed formally in proxy statements. This finding calls into question the adequacy and reliability of required public disclosures related to audit committee performance in the U.S.

The results also provide evidence that audit committee members perceive internal control evaluation as the most important audit committee oversight area. This finding is consistent with the importance placed on internal control evaluation forwarded by numerous entities external to the audit committee function (e.g., Treadway Commission, 1987; POB, 1993, 1994; Braiotta, 1994; COSO, 1994). Other duties considered important included evaluating the effectiveness of internal and external auditors, and reviewing the financial statements. Duties related to evaluating special transactions, monitoring compliance with company codes of conduct and recommending and setting fees for the external auditor were viewed as relatively unimportant.

BACKGROUND

Audit committee performance of existing oversight responsibilities has come under close scrutiny in the U.S. in recent years (e.g., Treadway Commission, 1987; Verschoor, 1989, 1990a, 1990b, 1993; GAO, 1991; Hickok, 1993; POB, 1993, 1994; Price Waterhouse, 1993; Rittenberg and Nair, 1993a, 1993b; Wolnizer, 1993, 1995; COSO, 1994). For example, the Public Oversight Board suggested that 'in too many instances the audit committees do not perform their duties adequately and in many cases do not understand their responsibilities' (POB, 1993, p. 50). Rittenberg and Nair (1993a) found that audit committee members believe they need to better understand their assigned duties and responsibilities to improve audit committee effectiveness. These concerns about audit committee performance on assigned responsibilities are compounded by suggestions that the scope of audit committee responsibilities should and/or will expand (Smith, 1991; Abdolmohammadi and Levy, 1992; Ernst & Young, 1992; Price Waterhouse, 1993; Rezaee and Farmer, 1994; Coopers & Lybrand, 1995). In particular, Price Waterhouse and the Institute of

Internal Auditors indicated that audit committees can expect to assume increased responsibilities in areas related to international operations, joint ventures, environmental matters and internal controls (Price Waterhouse, 1993).

The exploration of audit committee oversight in the U.S. has followed a varied path over the years. The first step in the evolution of audit committees was the McKesson and Robbins, Inc. incident in the late 1930s (Securities and Exchange Commission [SEC], 1940). This management fraud case involved asset overstatements that went undetected by the firm's external auditor, prompting discussion of the need to provide additional protection to outside investors who rely on financial statements. The SEC responded to the McKesson and Robbins incident by recommending that publicly held companies create audit committees to improve the integrity of corporate financial information. At approximately the same time, the New York Stock Exchange and the American Institute of Accountants (now the AICPA) issued similar recommendations.

Despite the interest generated by the McKesson and Robbins case, it was not until the late 1960s and 1970s that audit committee oversight in the U.S. generated widespread attention. Heightened awareness of audit committees resulted from increased demands for corporate governance and accountability related to boards of directors. In particular, increased legal exposure for corporate boards resulted from a series of lawsuits and investigations during the period.[1] The SEC reasserted its interest in audit committees by: (a) urging registrants to form audit committees comprised of outside directors (SEC, 1972); (b) requiring all publicly held companies' proxies to disclose information about the existence and composition of their audit committees (SEC, 1974a); and (c) requiring publicly held companies to state the number of audit committee meetings held annually and to describe their audit committees' function (SEC, 1978).

Expanded liability imposed on boards also motivated legislation related to audit committee oversight. In 1977, Congress addressed corporate governance by enacting the *Foreign Corrupt Practices Act* (FCPA). The FCPA was legislated to impose accounting and internal control standards on corporations. For corporate boards and audit committees, the Act applied increased pressure for directors to comply with enforceable guidelines. More recently, the *Federal Deposit Insurance Corporation Improvement Act* (FDICIA) of 1991 called for mandatory expertise requirements for audit committee members in the banking industry. Although the FDICIA only pertains to depository institutions, the regulation of audit committees may indicate a trend that will carry over to other industries (Deloitte & Touche, 1993). Banking industry problems also motivated a study by the General Accounting Office, leading to criticism of audit committee member independence and expertise related to oversight responsibilities (GAO, 1991).

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[1] A detailed chronology of events leading to increased director liability appears in Schwartz (1980) and Eichenseher and Shields (1985). Examples of relevant cases include *Escott v. BarChris Construction Corp.* (1968); *Gould v. American Hawaiian Steamship Co.* (1972); *SEC v. Mattel, Inc.* (SEC 1974b); and *Report of Investigation in the Matter of Stirling Homex Corporation* (SEC 1975).

In 1987, the National Committee on Fraudulent Financial Reporting (the Treadway Commission) was created to identify factors that can lead to fraudulent financial reporting and recommend procedures to reduce fraud incidences (Treadway Commission, 1987). The Treadway report identified audit committees as effective means for corporate governance and suggested a list of objectives for audit committees to consider. Among the numerous recommendations detailed in the report, the Commission stated that audit committees should be 'informed, vigilant, and effective overseers of the financial reporting process and the company's internal controls' (p. 41).

A number of stock exchanges reacted quickly to the heightened interest in boards of directors and audit committees. The New York Stock Exchange (NYSE) mandated audit committees for companies traded on its exchange in 1978. In 1989, the National Association of Securities Dealers joined the NYSE by requiring audit committees for companies listed on NASDAQ/NMS. The American Stock Exchange (AMEX), while not requiring audit committees for its listed companies, began in 1979 to strongly recommend audit committees with members that are independent of management.

In 1989, the AICPA established a requirement for external auditors to communicate formally with audit committees as a standard part of the audit. Statement on Auditing Standards (SAS) 61, *Communication with Audit Committees*, was issued with the objective of ensuring 'that the audit committee receives additional information regarding the scope of the audit that may assist the audit committee in overseeing the financial reporting and disclosure process for which management is responsible' (AICPA, 1993). Communication between external auditors and audit committees also is required or recommended in certain situations by SAS 60, *Communication of Internal Control Structure Related Matters Noted in an Audit*; SAS 54, *Illegal Acts by Clients*; and SAS 53, *The Auditor's Responsibility to Detect and Report Errors and Irregularities* (AICPA, 1993).

Interest in audit committee oversight continues to grow among public-interest and private-interest groups, as well as legislative and regulatory bodies. Many public accounting firms provide guidance for new and existing audit committees (e.g., Coopers & Lybrand, 1988, 1993, 1995; Ernst & Young, 1992; Deloitte & Touche, 1993; Price Waterhouse, 1993). The Committee of Sponsoring Organizations suggested that audit responsibility in evaluating and strengthening controls (COSO, 1994). The POB recommended that audit committees 'evaluate the scope and adequacy of their oversight activities to ensure that they are as comprehensive as those recommended by the Treadway Commission' (POB, 1993, p. 50). The Institute of Internal Auditors and Price Waterhouse collected data from audit partners, directors of internal auditing and audit committee chairmen, resulting in a set of recommended oversight practices for audit committees to follow (Price Waterhouse, 1993). The Conference Board also has conducted a number of audit committee surveys in an effort to understand and improve the function (Bacon, 1979, 1988, 1993).

In academic research, a large percentage of the empirical work related to audit committee oversight has been perception-based and focused on audit committee effectiveness. One area of particular interest is audit committee member expertise and experience effects related to oversight areas (e.g., Mautz and Neumann, 1970, 1977; Robertson and Deakin, 1977; Grinaker *et al.*, 1978; GAO, 1991; Kalbers, 1992a, 1992b; McMullen, 1992; Kalbers and Fogarty, 1993; Price Waterhouse, 1993; DeZoort, 1997; Lee and Stone, 1997). Findings in this area indicate that, while expertise and experience in oversight areas are perceived as critical components of overall committee effectiveness, they are lacking for many audit committee members.

A number of audit committee studies have focused on comparative analyses comparing perceptions of audit committee oversight. For example, Kalbers (1992a) found that external auditors held significantly lower opinions of audit committee members' expertise in oversight areas than did the audit committee members. Similarly, Birkett (1980) found that external auditors consistently rated their audit committees as less effective than did the audit committee members. Other studies indicate that audit committee members believe their committees comply with a variety of prescribed standards and procedures (Reinstein, 1980; Braiotta, 1986; Castellano *et al.*, 1989).

Researchers also have evaluated audit committee members' perceptions of their oversight responsibilities. In particular, this study provides an extension of Abdolmohammadi and Levy (1992), who asked audit committee members what they considered to be the major responsibility(ies) of an audit committee member. The results indicated high variation in perceived responsibilities. Coopers & Lybrand (1995) also asked audit committees about their duties and responsibilities. The evidence suggested that the scope of audit committee activity has expanded over the past two decades and that most audit committees conduct a wide range of oversight duties.

In summary, the extant literature related to audit committee oversight reflects a diverse set of interests forwarded by policy-makers, interest groups and researchers. The pervasive theme across the literature is that audit committee oversight is a major concern to many groups. In particular, the adequacy of oversight for assigned responsibilities and the future expansion of duties emerge consistently in the literature as the two primary areas of interest. However, with few exceptions, in-depth analyses of audit committee members' perceptions of the importance of their assigned oversight responsibilities and opinions about the proposed expansion of responsibilities are scarce.

METHOD

Participants

Five hundred audit committee members were selected from a random sample of 134 companies from the NYSE, the AMEX and the NASDAQ/NMS.[2] The use of the three major U.S. trading venues allowed comparisons of companies with different audit committee formation and composition requirements. A majority (70%) of the companies selected were listed on the NYSE. The NYSE requires that its companies maintain an audit committee comprised solely of directors independent of management. However, because of regulatory differences among exchanges, groups of AMEX and NASDAQ/NMS companies (15% each) were also selected to evaluate audit committee member perceptions and the possibility of an inside director bias.[3] Both company and audit committee member information were collected from the LEXIS/NEXIS database using 1993 and 1994 proxy statements. Companies without 1993 or 1994 proxy statements listed were contacted by phone for audit committee information.

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[2] A pretest sample of forty-three audit committee members was selected from a random sample of ten NYSE companies. Each member was mailed an introductory letter, a copy of the research instrument, and a separate sheet containing questions related to the clarity, length, readability and content of the instrument. The pre-test mailing was supplemented with a combination of phone and face-to-face interviews with five audit committee members. Five accounting researchers also reviewed the instrument. No major changes were made to the research instrument as a result of the pre-testing.

Each audit committee member received an introductory letter, a copy of the research instrument and a self-addressed stamped return envelope. All individuals were informed that their participation was voluntary and their responses would remain confidential.[4] In addition, all respondents were offered a summary of the results upon request. All research materials were prepared and forwarded to the sample following Dillman's Total Design Method (TDM) for maximizing response rate and optimizing response quality (Dillman, 1978).[5]

Survey Instrument

The descriptive component The descriptive component of the survey addressed audit committee members' abilities to recognize their group's responsibilities and provide normative statements about the assignment of such objectives. Wolnizer's (1995) set of seventeen audit committee objectives provided a basis for measuring members' responses (see Table 1). Numerous sources have published lists of audit committee objectives, resulting in a great deal of prescriptive overlap (e.g., Treadway Commission, 1987; Macdonald Commission, 1988; Cadbury Committee, 1992; Price Waterhouse, 1993; Coopers & Lybrand, 1995). The Wolnizer list of objectives was selected because it is a comprehensive set of responsibilities that synthesizes the recommendations produced by these other sources.

Assigned responsibilities were identified in the proxy statements of the sampled companies. The respondents were asked three questions related to their assigned responsibilities:

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[3] AMEX and NASDAQ/NMS companies are required to maintain audit committees with only a majority of outside directors. A search for insiders was conducted on respondents from AMEX and NASDAQ/NMS companies. Supplemental analyses revealed that only two of the twenty-six respondents from these companies were insiders. Therefore, the overwhelming majority (116/118) of the responses came from 'independent' directors. Data from the survey suggest that inside director response bias was not a problem.

[4] All of the research materials were approved by the Human Subjects Committee at the author's institution.

[5] Dillman's TDM is based on social exchange theory, which suggests that subject participation can be improved by increasing involvement along parameters related to reward, cost and trust. This proactive approach was taken because audit committee members are a dispersed and diverse group of individuals who may be characterized as an inherently difficult subject pool to access.

TABLE 1
WOLNIZER'S OBJECTIVES

Financial Reporting	
1	(OBJ1) Review all financial statements, whether interim or annual.
2	(OBJ2) Review all existing accounting policies.
3	(OBJ3) Review systems of internal control.
4	(OBJ4) Evaluate exposure to fraud.
5	(OBJ5) Review all significant transactions.
6	(OBJ6) Appraise key management estimates, judgments and valuations.
Auditing	
7	(OBJ7) Recommend the appointment of and fee for the external auditor.
8	(OBJ8) Review the plans for, and the effectiveness of, the internal and external auditors.
9	(OBJ9) Review the arrangements for coordinating the work done by internal and external auditors.
10	(OBJ10) Review the external auditor's management letter.
11	(OBJ11) Determine that auditors are free from undue influence and managerial interference.
12	(OBJ12) Request to be informed if there is a dispute between auditors and managers.
13	(OBJ13) Monitor the resources allocated to the internal audit function.
14	(OBJ14) Review the nature and magnitude of fees paid to the auditor for non-audit services.
Other corporate governance	
15	(OBJ15) Facilitate communication between the external auditors and the board of directors.
16	(OBJ16) Review corporate policies and practices in light of ethical considerations.
17	(OBJ17) Monitor compliance with the company's code of conduct.

1. Is the duty assigned formally to your committee?
2. Is the duty performed, but not assigned, to your committee?
3. Is the duty appropriate for audit committees?

The first question provided a basis for assessing the association between audit committee members' perceptions of their assigned oversight objectives and those communicated publicly. There is a need to evaluate the quality and nature of audit committee disclosures (e.g., audit committee charters, proxy statement listings, audit committee reports) because they provide signals relied upon by users. Proxy statements offer public statements of duties assigned and performed that, in a litigious world, directors should take seriously and thus be able to recognize. The second question addressed the possibility that audit committees may perform oversight functions that are not assigned formally. In particular, respondents had an opportunity to distinguish between duties assigned formally in proxy statements and duties performed but not assigned formally to the audit committee. The third question provided an opportunity for audit committee members to make normative statements about the list of proposed oversight objectives. This feedback could provide useful insight into how audit committee members feel about recommendations to expand the audit committee role in corporate governance.

The survey also solicited audit committee members' perceptions of the importance of audit committee member expertise related to accounting, auditing and legal issues. The focus of the inquiry was on opinions related to the need for *all* members of an audit committee to have sufficient expertise. Such inquiry provides insight into whether, and to what extent, audit committee members believe it is important to have individual expertise within the audit committee function.

Finally, a series of questions asked audit committee members about their familiarity with the detail of generally accepted accounting principles (GAAP), generally accepted auditing standards (GAAS), and the legal liability issues that face them as audit committee members. These questions were designed to provide insight into how audit committee members perceive their personal expertise in areas related to typically specified oversight responsibilities.

The exploratory component The exploratory component of the survey offered opportunities for audit committee members to provide their opinions of the key issues and challenges currently addressed by their respective committees. This component was designed to evaluate important audit committee issues across a variety of industries.

Two methods were used to elicit respondents' perceptions of key issues. The first method involved an open-ended question asking audit committee members about the key task areas and issues currently facing their committee. The open-response format encouraged detailed descriptions and allowed respondents the freedom to communicate any areas of concern. The second method required audit committee members to rank their committee's five most important objectives (based on the Wolnizer, 1995, list) from the most important to least important.

RESULTS

Data Collection

The results of survey mailings and phone follow-ups revealed that 160 of the sampled individuals were no longer audit committee members at their respective companies. After the initial mailing and three follow-ups, 118 responses were returned from the remaining sample of 340 audit committee members for an adjusted response rate of 35 per cent.[6] Seventy of the 134 companies (52%) sampled were represented by at least one respondent.[7]

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[6] The possibility of non-response bias was examined using extrapolation wave analysis. This *ex post* method is based on the assumption that those who respond late in the research process are more like non-respondents than those who respond early in the process (Armstrong and Overton, 1977). In particular, the method involves comparisons of responses received after the first, second and third requests for participation. The analyses revealed no evidence of non-response bias for any of the selected parameters ($p < .05$).

[7] Seventeen of the seventy companies represented had more than one respondent. To address the possibility of a company policy response bias, additional analyses were performed comparing the results from the 118 respondents to results from only seventy respondents (one from each company) on the descriptive component results. In particular, for companies with more than one respondent, a composite mean score was calculated for that company and considered with the other one-respondent companies. The results of the supplemental t-test comparisons revealed no significant differences ($p < .05$) for any of the questions evaluated. Thus, it appears that multiple respondents from individual companies did not impose a company policy bias.

Demographics

The demographics indicate that the majority of respondents were male (97%), employed (64%), and between 60 and 70 years of age (51%). The audit committee members had an average of 10.47 years experience on audit committees. Forty-five members (39%) indicated they were audit committee chairs. Only twenty-nine respondents (28%) indicated they had formal accounting experience. Similarly, only seventeen respondents (16%) indicated they had auditing experience. These findings are similar to the relatively small percentage of audit committee members with accounting or auditing experience found in other studies (e.g., GAO, 1991; DeZoort, 1997; Lee and Stone, 1997). The average number of annual audit committee meetings was 3.6, with each meeting lasting an average of 2.17 hours.

Descriptive Component Results

The results of the questions related to the importance of having technical accounting, auditing and legal expertise suggest audit committee members place a moderately high value on individual expertise for all audit committee members. In particular, the results (measured on a seven-point Likert scale) indicate that the respondents believe it is important for *all* audit committee members to have a sufficient level of expertise related to technical accounting issues ($\bar{x} = 4.88$, $sd = 1.31$) and technical auditing issues ($\bar{x} = 5.12$, $sd = 1.25$). The importance of industry familiarity was also indicated by the respondents ($\bar{x} = 5.82$, $sd = 1.16$). The responses failed to produce significant differences across accounting, auditing and industry experience levels, across stock exchange and one-digit SIC industry classification, or between audit committee chairmen and other members ($p < .05$).

The results of the questions related to respondents' familiarity with GAAP, GAAS and the legal liability issues facing audit committee members reveal moderate levels of familiarity. In particular, the results (on a seven-point Likert scale) indicate a relatively high level of understanding of legal liability issues ($\bar{x} = 5.74$, $sd = 1.11$); respondents communicated lower levels of familiarity with GAAP ($\bar{x} = 5.11$, $sd = 1.30$) and GAAS ($\bar{x} = 4.55$, $sd = 1.52$). However, the results still indicate a perceived need to understand technical accounting and auditing issues. A series of *t*-tests revealed that audit committee chairs reported significantly higher levels of GAAP understanding, GAAS understanding and familiarity with liability issues than did the other audit committee members ($p < .01$).[8] Audit committee members with either accounting or auditing experience also reported significantly higher levels of understanding of all three areas than did audit committee members without experience ($p < .05$). Significant differences were not observed across stock exchange or one-digit SIC industry code for GAAP familiarity ($p = .673$), GAAS familiarity ($p = .600$), and liability awareness ($p = .254$).

The descriptive component of the survey also was designed to measure audit committee members' abilities to identify their audit committee's assigned oversight responsibilities. Table 2 presents the results related to the first two questions. Two methods of analysis were used. First, a chi-square test for homogeneity tested for differences between the assigned audit committee objectives listed in proxy statements and the assigned audit committee objectives recognized by audit committee members. Second, a phi coefficient was calculated to test the strength of association between source (i.e., proxy statement or audit committee member) and assignment (i.e., yes or no). The phi coefficient is a correlation coefficient appropriate when both variables are nominal dichotomous variables.[9]

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[8] For all tests involving Likert scale (nominal) data, a non-parametric analog (e.g., the Mann–Whitney–Wilcoxon procedure or the Kruskal–Wallis procedure) was used to test the robustness of the parametric test results. In all cases, the nonparametric results mirrored the parametric results.

The overall chi-square results in Table 2 indicate significant differences between what audit committee members perceive as their assigned responsibilities and their actual assigned responsibilities listed in proxy statements ($\chi^2 = 460.41, p < .001$). The overall phi coefficient results support the chi-square test results. The phi coefficient of .358 ($p < .01$), indicates that the proxy statements tended to list responsibilities and the audit committee members tended not to recognize assigned responsibilities. The results of the chi-square tests on the individual objectives reveal that only two of the seventeen objectives presented were recognized by the audit committee respondents as formally assigned to their respective audit committees. In particular, the objectives related to reviewing internal controls (OBJ3) and to reviewing the plans for, and the effectiveness of, the internal and external auditors (OBJ8) were the only assigned objectives the respondents recognized.[10]

The second question produced responses related to the performance of oversight objectives not formally assigned to the audit committee and provide evidence that audit committee members believe they do extensive amounts of work beyond their committees' formally assigned duties. In particular, the results in Table 3 indicate that appraising key management estimates, judgments and valuations (OBJ6) and requesting information about disputes between auditors and management (OBJ12) were not assigned but performed as often as they were assigned (approximately 50% of the time). For almost half of the objectives (8 out of 17), at least one third of the respondents indicated their audit committee performed the duty without formal assignment.

The third question responses, presented in Table 4, indicate that a majority of the respondents agree that the Wolnizer oversight objectives are appropriate for audit committees. For all of the proposed audit committee objectives, more than 60 per cent of respondents suggested the objective should be part of the audit committee function. This finding suggests that, despite a frequent lack of formal assignment and

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[9] Phi coefficient boundaries are –1 and +1. In the analysis, a –1 coefficient would indicate all audit committee members believed a responsibility was assigned when, in fact, it never was. A +1 coefficient would indicate that a responsibility that was always assigned in proxy statements was never recognized as assigned by audit committee members. A zero coefficient would indicate no difference between the two.

[10] Additional analyses were run to evaluate the level of agreement between respondents from the same company about the duties assigned to their committee. Specifically, the average pairwise association was calculated using Cramer's coefficients for all possible pairs of respondents from similar companies. The mean coefficient of .382 indicates a moderate level of agreement between members from the same firm.

TABLE 2

COMPARISON OF OVERSIGHT DUTIES LISTED IN PROXY STATEMENTS AND RESPONDENTS' PERCEPTIONS OF DUTIES ASSIGNED

Objective	Proxy assigned? (Yes/No)	AC mbr assigned? (Yes/No)	χ^2	p-value	phi coeff
Financial reporting					
(OBJ1) Review all financial statements.	83/29	48/64	22.52	.001	.317
(OBJ2) Review all existing accounting policies.	73/39	44/68	15.05	.001	.259
(OBJ3) Review systems of internal control.	87/25	80/32	**1.15**	**.283**	**.072**
(OBJ4) Evaluate exposure to fraud.	58/54	0/112	78.27	.001	.591
(OBJ5) Review all significant transactions.	56/56	2/110	67.84	.001	.550
(OBJ6) Appraise key management estimates, judgments and valuations.	38/74	0/112	45.76	.001	.452
Auditing					
(OBJ7) Recommend the appointment of and fee for the external auditor.	98/14	80/32	8.86	.001	.199
(OBJ8) Review plans for/effectiveness of the internal and external auditors.	89/23	87/25	**0.11**	**.745**	**.022**
(OBJ9) Review coordination of internal and external auditor work.	59/53	12/100	45.55	.001	.451
(OBJ10) Review the external auditor's management letter.	91/21	62/50	17.34	.001	.278
(OBJ11) Determine that auditors are free from undue managerial influence.	75/37	13/99	71.95	.001	.567
(OBJ12) Request to be informed if there is an auditor–management dispute.	49/63	4/108	50.05	.001	.473
(OBJ13) Monitor the resources allocated to the internal audit function.	61/51	0/112	83.83	.001	.612
(OBJ14) Review fees paid to the auditor for non-audit services.	85/27	18/94	80.68	.001	.600
Other corporate governance					
(OBJ15) Facilitate communication between the external auditors and board.	68/44	12/100	60.98	.001	.522
(OBJ16) Review corporate policies and practices related to ethical issues.	60/52	7/105	59.82	.001	.517
(OBJ17) Monitor compliance with the company's code of conduct.	53/59	17/95	26.93	.001	.347
Overall	**1125/667**	**486/1306**	**460.40**	**.001**	**.358**

a consistent lack of duty recognition, members agree with calls that audit committees should be doing more than they are for corporate governance.

Exploratory Component Results

The primary purpose of the survey's exploratory component was to gather information related to what audit committee members perceive as important or critical oversight domains. Two alternate methods, open-response and ranking, were used to assess response reliability. The overall results presented in Figure 1 clearly

TABLE 3

ANALYSIS OF OVERSIGHT WORK PERFORMED BUT NOT FORMALLY ASSIGNED

Objective	Objective assigned	Objective performed but not assigned
Financial reporting		
(OBJ1) Review all financial statements.	83 (79%)	22 (21%)
(OBJ2) Review all existing accounting policies	73 (73%)	27 (27%)
(OBJ3) Review systems of internal control.	87 (87%)	13 (13%)
(OBJ4) Evaluate exposure to fraud.	58 (60%)	38 (40%)
(OBJ5) Review all significant transactions.	56 (62%)	35 (38%)
(OBJ6) Appraise key management estimates, judgments and valuations.	38 (46%)	44 (54%)
Auditing		
(OBJ7) Recommend the appointment of and fee for the external auditor.	98 (98%)	2 (2%)
(OBJ8) Review plans for/effectiveness of the internal and external auditors.	89 (88%)	12 (12%)
(OBJ9) Review coordination of internal and external auditor work.	59 (65%)	32 (35%)
(OBJ10) Review the external auditor's management letter.	91 (87%)	13 (13%)
(OBJ11) Determine that auditors are free from undue managerial influence.	75 (74%)	26 (26%)
(OBJ12) Request to be informed if there is an auditor–management dispute.	49 (52%)	46 (48%)
(OBJ13) Monitor the resources allocated to the internal audit function.	61 (67%)	30 (33%)
(OBJ14) Review fees paid to the auditor for non-audit services.	85 (83%)	18 (17%)
Other corporate governance		
(OBJ15) Facilitate communication between the external auditors and board.	68 (65%)	37 (35%)
(OBJ16) Review corporate policies and practices related to ethical issues.	60 (65%)	33 (35%)
(OBJ17) Monitor compliance with the company's code of conduct.	53 (65%)	28 (35%)

indicate that internal control evaluation is one of the most important, if not the most important, oversight areas faced by audit committees.[11] Panel A presents respondents' rankings of the five most important objectives for audit committees. The most important oversight objectives include: (a) evaluate internal control structure; (b) review all financial statements; (c) review effectiveness of the internal

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[11] It should be noted that this study did not assess the absolute importance of oversight objectives. Instead, the study focuses on the relative importance of various duties. Therefore, the possibility exists that those oversight duties listed or ranked as most important (e.g., internal control review) are not really perceived as important to the respondents. However, this possibility seems unlikely in light of the high awareness of director liability issues discussed earlier in the article.

TABLE 4

NORMATIVE ASSESSMENT OF OBJECTIVE ASSIGNMENT

Objective	No. agreeing duty is appropriate/No. respondents	Percentage
Financial reporting		
(OBJ1) Review all financial statements.	95/118	81
(OBJ2) Review all existing accounting policies	91/118	77
(OBJ3) Review systems of internal control.	97/118	82
(OBJ4) Evaluate exposure to fraud.	90/118	76
(OBJ5) Review all significant transactions.	77/118	65
(OBJ6) Appraise key management estimates, judgments and valuations.	73/118	62
Auditing		
(OBJ7) Recommend the appointment of and fee for the external auditor.	96/118	81
(OBJ8) Review plans for/effectiveness of the internal and external auditors.	99/118	84
(OBJ9) Review coordination of internal and external auditor work.	82/118	69
(OBJ10) Review the external auditor's management letter.	96/118	81
(OBJ11) Determine that auditors are free from undue managerial influence.	96/118	81
(OBJ12) Request to be informed if there is an auditor–management dispute.	94/118	80
(OBJ13) Monitor the resources allocated to the internal audit function.	90/118	76
(OBJ14) Review fees paid to the auditor for non-audit services.	94/118	80
Other corporate governance		
(OBJ15) Facilitate communication between the external auditors and board.	92/118	78
(OBJ16) Review corporate policies and practices related to ethical issues.	87/118	74
(OBJ17) Monitor compliance with the company's code of conduct.	79/118	67

and external auditor; (d) review external auditor's management letter; and (e) determine that auditors are free from undue influence. A one-way ANOVA and Tukey's HSD follow-up indicated that internal control evaluation was significantly more important than all other oversight responsibilities except for financial statement review ($F_{17,1900} = 23.60$, $p < .01$).[12] Differences across industry, exchange or audit committee experience level were not observed ($p < .05$).

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[12] The results of the ANOVA results should be interpreted with caution because ordinal data were used. However, with incomplete rankings (not all of Wolnizer's seventeen objectives had to be ranked), non-parametric analogues would not have been viable because of the unequal cell sizes (i.e., incomplete rankings). The consensus of the statisticians consulted was that ANOVA is reasonably robust in this case and the best test in this situation. However, the results should be interpreted carefully in light of the assumption violations.

Panel B presents respondents' perceptions of the important task areas and issues faced by their audit committees. The results are consistent with the Panel A findings. In particular, internal control evaluation, internal auditor/external auditor effectiveness evaluation and financial statement review emerged as the most important oversight tasks for audit committees. Again, a one-way ANOVA indicated that internal control evaluation emerged as an important oversight domain, with rankings significantly higher than all other tasks and issues listed ($F_{19,1900} = 11.74$, $p < .01$). Evaluation of internal auditor and external effectiveness, and financial statement review, also appeared repeatedly as areas of concern for the respondents. Significant differences were not observed across the background variables ($p < .05$).

SUMMARY AND CONCLUSION

This study contributes to understanding audit committee oversight in a number of ways. First, the surveyed audit committee members generally were not able to recognize their assigned responsibilities as detailed in company proxy statements. Only two assigned objectives (review internal controls and review work of internal and external auditor) were recognized readily by respondents. However, they indicated that much of their work was performed in areas not formally assigned to respective committees.

This result has important public policy implications because it raises serious questions about the adequacy of signals provided by audit committees. Specifically, it calls into question the assumption that audit committee responsibilities listed in proxy statements reflect accurately the scope of audit committee work. With proxy statements offering public statements of duties assigned and performed in a litigious world, it is reasonable to expect that companies and directors would take such disclosure seriously. To the extent that audit committee charters and alternative forms of disclosure describing audit committee work (e.g., proxy statement listings, audit committee reports) are signals relied upon by users, this work suggests a continued need to evaluate the quality of such disclosures.

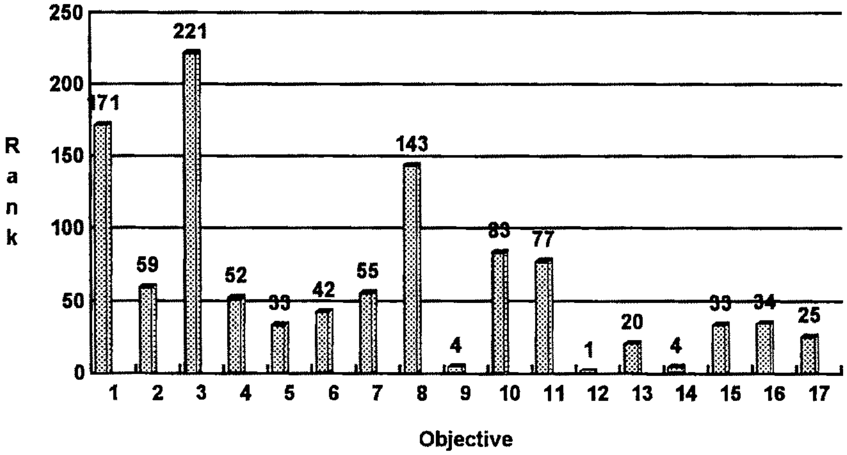
In particular, interested users need to scrutinize carefully the reliability of signals of audit committee oversight and the implications for committee effectiveness. Policy-makers also should consider the accuracy of disclosures, whether voluntary or mandated. For example, in the U.S., the Treadway Commission (1987) and the POB (1993) have recommended that the SEC require audit committees to provide audit committee reports in corporate annual reports to shareholders. Findings in this survey highlight the importance of policy-makers considering the accuracy of such public disclosure in addition to considering whether or not such disclosure is needed.

The findings related to proxy statement disclosure also have a number of important research implications. In terms of theory development and testing, the results could be used to motivate additional work in areas related to agency theory and signalling theory. For example, the findings provide an interesting new context for evaluating agency relationships. In an economically rational world, corporate boards and audit committees have incentives to avoid the negative consequences

FIGURE 1

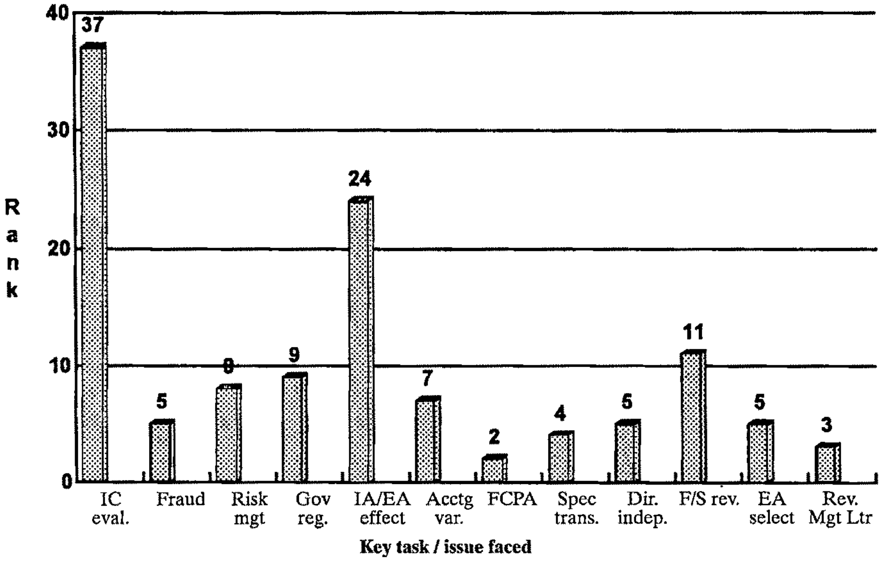
SURVEY RESULTS

Panel A: Ranking of Wolnizer's Objectives



Note: See Table 1 for a list of Wolnizer's objectives.

Panel B: Important tasks / issues faced by audit committees



IC eval.=evaluate internal controls
Fraud=evaluate fraud
Risk mgt=risk management
Gov reg.=government regulation
IA/EA effect=evaluate internal/external auditor effectiveness
Acctg var.=understand significant changes in acounting policies / procedures
FCPA=comply with *Foreign Corrupt Practices Act*
Spec trans.=identify and understand special transactions
Dir. indep.=evaluate independence of directors
F/S rev.=review financial statements
EA select=select and set fee for external auditor
Rev. Mgt Ltr=review management letter

(e.g., litigation, damage to reputation) of failed monitoring efforts. In addition, agency theory suggests that audit committees, as corporate governance monitors, have an incentive to provide accurate public signals of their work and be familiar with those signals in an effort to mitigate information asymmetry effects and avoid an expectation gap problem.

As well, the descriptive component results indicate that audit committee members appreciate the importance of *all* audit committee members possessing sufficient expertise in areas related to accounting, auditing, and the law. While consistent with the recommendations of numerous interest groups, regulatory and legislative bodies, and researchers, these findings are somewhat surprising given that many respondents indicated they lacked sufficient expertise in these areas. Certainly, normative questions about committee composition and expertise continue to circulate among interested parties related to corporate governance (e.g., Wolnizer, 1995; Lee and Stone, 1997; GAO 1991). Future research should continue to explore audit committee member expertise, and the relation between expertise and committee composition, in critical oversight.

The results also provide evidence that audit committee members agree with the proposed expansion of committee responsibilities. This finding also is somewhat surprising given the respondents' high awareness of director legal liability. This result also contradicts the notion that audit committee members (and directors in general) who are unable to recognize their assigned duties, who understand their liability exposure in a litigious world and who question their own expertise in oversight areas would seek to limit their exposure by restricting the scope of their oversight work.

These exploratory results provide insight into what oversight areas audit committee members perceive as critical to the audit committee function. The two methods of exploration (i.e., ranking and open-ended question) yielded similar results. Internal control evaluation was consistently listed and ranked as the most important oversight responsibility. This result existed across experience level, industry and stock market, and is consistent with the importance of internal controls as argued by others (e.g., POB, 1993, 1994; Price Waterhouse, 1993; Braiotta, 1994; COSO, 1994). Financial statement review and internal auditor/external auditor evaluation also appeared consistently as critical oversight areas.

Respondents highlighted the importance of selecting members with adequate relevant expertise and providing adequate audit committee training and continuing education. Interestingly, a number of oversight objectives commonly observed in objective disclosures were deemed relatively unimportant by the audit committee members. External auditor selection and fee approval, special/significant transaction review and accounting policy monitoring were identified as relatively unimportant compared to other oversight objectives. Such observations lend credence to the suggestion that certain audit committee duties, such as external auditor selection and fee arrangement, are simply 'rubber-stamped' by audit committees.

Further, the data collected in this survey provide an interesting empirical complement to Wolnizer's (1995) arguments about audit committee effectiveness related to financial reporting. In particular, Wolnizer argued that audit committees are not likely to enhance the reliability of financial reporting unless there are changes in accounting and auditing practices so that financial statements can be authenticated. The findings here suggest that audit committee members perceived their financial reporting responsibilities (e.g., review financial statements) as particularly important, regardless of whether they can actually accomplish anything in this area.

Overall, the survey results should be interpreted cautiously. As with all mail survey research, the possibility of non-response bias limits the interpretability of the results. Although no significant differences were found between early and late respondents, it is possible that audit committee members who chose not to participate might have substantially different opinions than those who participated. Response bias also is a consideration because of the lack of control over how, where or when audit committee members responded to the instrument. In particular, the results could be biased by directors lacking independence. Although it appears that an overwhelming number of the respondents were outside directors, there are inherent difficulties associated with identifying 'independent' directors (Vicknair *et al.*, 1993, for a discussion of 'grey' area directors).

Interpretation of the results also is tempered by the lack of information about the relationships between objectives. In this study, all of the Wolnizer objectives are assumed independent. In fact, many of the objectives listed could be correlated. For example, respondents might have perceived OBJ3 (Evaluate internal control structure) as an important general objective that subsumes another objective like OBJ4 (Evaluate exposure to fraud), which failed to emerge as an important objective. Nevertheless, the survey provides some initial insight into how audit committee members perceive their oversight work and prioritize their duties.

The tasks of defining and understanding audit committee oversight are critical to improving the credibility of the corporate audit committee as a corporate governance mechanism. The tasks' importance are magnified at a time when there is pressure to increase the quantitative and qualitative scope of audit committees' oversight responsibilities. While this work is clearly exploratory, it does contribute to understanding audit committee oversight by bridging the normative literature related to audit committee oversight to audit committee members' perceptions of their work. Although additional research is needed to clarify the role of the audit committee, the survey results certainly justify the need to evaluate more closely the possibility that the benefits commonly associated with audit committees are more rhetorical than substantive.

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Intraday Returns and the Frequency of Trading at the Ask on the Sydney Futures Exchange: A Research Note

This article documents and provides explanations for intraday patterns in returns for the Share Price Index (SPI) futures contract traded on the Sydney Futures Exchange (SFE). Consistent with overseas futures markets research, a positive and significant overnight return is documented. Unlike overseas futures markets, we find little evidence of an end of day price rise. Our evidence suggests that overnight returns for the SPI contract are largely driven by the way returns are typically measured, which ignores the fact that there is a significantly greater frequency of sellers at the market close and buyers at the start of the day. These patterns are consistent with hedging behaviour by futures traders with long positions in the underlying stock.

Key words: Bid-ask bounce; Futures; Intraday patterns.

This study analyses intraday patterns in returns of the Share Price Index (SPI) futures contract on the Sydney Futures Exchange (SFE). We first document intraday patterns in the returns of SPI futures, and then examine whether any emerging patterns can be explained by the method typically used to measure returns and/or changes in the frequency of buyer- and seller-initiated trading.

The U.K. and U.S. provide the primary evidence of patterns in intraday returns on futures markets.[1] In the U.S., Ekman (1992) documented that S&P 500 Index futures returns are positive overnight, just after market opening (except on Mondays) and just prior to market close. Chang, Jain and Locke (1995) confirmed a price increase in the S&P 500 Index futures market just before the close. In the U.K., Yadav and Pope (1992) found the FTSE 100 Index futures contract traded on LIFFE tended to experience systematic price rises during the first hour of trading and overnight when the market was closed.[2] Hodgson (1994) documented the occurrence of positive

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[1] There is extensive evidence available in respect of equity markets (e.g., Wood, McInish and Ord, 1985; Harris, 1986; Jain and Joh, 1988; and Aitken, Brown and Walter, 1994).

[2] Not all evidence is consistent with this, however. Abhyankar, Copeland and Wong (1995) found no clear patterns in the level of returns in FTSE 100 Index futures other than positive significant spikes at 1.30 p.m. coinciding with the opening of U.S. markets.

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overnight and closing returns on SPI futures traded on the SFE. These works provided little commentary on interpreting those patterns. By contrast, this article examines whether SPI futures returns can be explained by the researcher's choice of return metric. Further examined is the link between floor (daytime) and automated (overnight) trading, the later of which occurs on the SFE's automated system.

We show that the overnight pattern in SPI futures returns is related to the preponderance of seller- (buyer-) initiated trading at the close (open) of trading. Our findings also suggest that previous results from other markets may be driven by the way returns are measured.

DATA AND METHOD

SPI futures were introduced by the SFE on 16 February 1983, with the All Ordinaries Index (AOI) of the Australian Stock Exchange (ASX) used as the underlying security.[3] The value of an SPI futures contract at present is calculated by multiplying the futures price (in points) by $25.[4] The minimum quotation (tick) permissible is one full basis point, except it is 0.1 of a basis point on the contract's last day of trading.

This study considers SPI futures returns during both floor trading and Sydney Computerized Market (SYCOM) trading sessions. Trading of SPI futures is carried out on an open-outcry basis in the morning session from 9.50 a.m. to 12.30 p.m. and in the afternoon session from 2 p.m. to 4.10 p.m.[5] SYCOM was introduced by the SFE on 30 November 1989 to provide overseas market participants with access to SFE products during their local trading hours.[6] SPI futures were subsequently integrated into this trading regime on 22 February 1990. SYCOM opens at 4.30 p.m. and accepts bids and offers up until 4.40 p.m., at which time trading begins. SYCOM originally closed at 12 a.m., but was extended to 2 a.m. on 1 April 1991, to 4 a.m. on 1 June 1992, to 6 a.m. on 10 January 1994, and to 7 a.m. on 25 November 1994. SYCOM closed at 4 a.m. over the sample period used in this work.

InterExchange Technical Committee (ITC) standard data from 1 June 1992 to 10 January 1994 were used for this study. The data were provided by the statistics department of the SFE. ITC records are compiled from the 'real time' observation and reporting of SFE 'pit' personnel,[7] and contain records of trades executed and high frequency snapshot records which show the best bid and ask. Similar though more extensive data exist in respect of overnight market activity on SYCOM.

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[3] Individual securities which make up the AOI are traded continuously on the ASX from approximately 10 a.m. to 4 p.m. Eastern Standard Time. See Aitken, Brown and Walter (1994) for a more detailed description of the mechanisms of the Stock Exchange Automated Trading System (SEATS) and in particular its effect on delayed calculation of the AOI following SEATS opening.

[4] Note that SPI futures were downsized (by a factor of four) on 11 October 1993. Prior to this the value of an index point was $100 and the minimum tick was 0.1 of an index point throughout the entire life of a contract.

[5] SPI futures lunchtime trading (12.30 p.m. to 2 p.m.) was introduced on 5 May 1994 and subsequently withdrawn on 30 September 1994 due to a lack of market interest.

[6] SYCOM terminals are located in the Sydney branches of SFE Floor Members. Orders on SYCOM are executed according to price and then time precedence rules.

[7] Pit personnel are employees of the SFE who are located in the midst of traders and verbally relay information (through electronic means) to the SFE information dissemination system.

Data for only one contract maturity, the 'dominant contract', are examined for each day. The dominant contract is defined as the SPI futures contract with the nearest delivery date. At the expiration of this contract, the contract which just prior had the next nearest expiration now has the nearest expiration and therefore becomes the dominant contract.[8] Note that this procedure is similar to that used in prior research (e.g., Ekman, 1992).[9]

Trade-to-trade and spread midpoint returns are calculated for the entire period for which the SFE floor and SYCOM are open. Since midpoint returns avoid any bid-ask bounce effects, they may also serve to determine whether such effects are driving the patterns observed in returns calculated from trade prices. For overnight periods, the trade price return (midpoint return) is calculated using the first trade (first quoted bid and ask prices) occurring on the SFE floor on a particular day, and the last trade (last quoted bid and ask prices) just prior to the close of the previous SYCOM session. For the opening ten-minute period, the trade price return (midpoint return) is calculated using the last trade price (last quoted bid and ask prices) occurring in the period and the first trade price (first quoted bid and ask prices) occurring in the period. For all other ten-minute periods during which the SFE floor or SYCOM are open, the trade price return (midpoint return) is calculated from the last trade (last quoted bid and ask prices) occurring in that period and the last trade (last quoted bid and ask prices) occurring in the previous period.

To analyse further the extent to which buyer- and seller-initiated trading is causing observed return patterns, the frequency of trades occurring at the bid and ask are also calculated at various times of the day, using the bid and ask immediately preceding each trade price used in the return analysis. We then calculate the proportion of trades which occur at a price more than one tick greater (less) than the midpoint, less than one tick greater (less) than the midpoint, and at the midpoint. A higher frequency of trades occurring at a price greater (less) than the midpoint is interpreted as evidence of buyer- (seller-) initiated trading (see Lee and Ready, 1991).

RESULTS

Panel A of Table 1 reports trade-to-trade returns for overnight, opening, floor closing and SYCOM closing periods. Panel B of Table 1 reports results for midpoint returns.[10]

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[8] Typically, for about one week prior to expiration of the nearest contract, trading volume is higher in the next nearest contract. We found similar results when we changed to the next nearest contract one week prior to expiration rather than at expiration.

[9] Since only the nearest contract is used, the results may not be extendable to longer term contracts.

[10] Although returns for all fifteen minute intervals during the trading day and during overnight trading were examined, there was no evidence of significant returns other than for those intervals documented in this study.

Table 1 (panel A) provides evidence of a significant positive overnight (SYCOM close to floor open) trade-to-trade return of 0.060 per cent. This is consistent with previous research by Ekman (1992) who finds the overnight return is positive on all days except Monday, and Hodgson (1994) who documents an overnight return of 0.033 per cent. Note, however, that the overnight midpoint return is considerably smaller in magnitude and not statistically significant. This suggests that the positive overnight return is largely driven by the way returns are measured. This in turn suggests that previous results documenting significant returns may in part be a statistical artefact caused by the failure to account for bid-ask bounce.

There is no evidence of a systematic return during the final ten minutes of floor trading, irrespective of the use of trade-to-trade or midpoint returns. This contrasts with previous research (Ekman, 1992, which documents a positive end-of-day return on every day except friday; and Hodgson, 1994 which finds a positive end-of-day return). A possible explanation for this finding is that closing patterns are a function of the length of time the market is closed. Because SYCOM reopens within forty minutes of the floor closing the usual overnight holding period of sixteen or more hours is significantly reduced. This in turn suggests that extended trading hours may further reduce these patterns.

No prior research has analysed price patterns on an automated overnight market. At SYCOM close we find a statistically significant midpoint return of 0.0081 per cent but an insignificant trade-to-trade return. This suggests that market participants requote bids and asks at higher prices just prior to SYCOM close. However, this is not visible in trade-to-trade returns due to a greater frequency of trading at the bid just prior to SYCOM close.

The opening period is found to have a significant positive return of 0.035 per cent. This again is generally consistent with extant research. For example, for the first fifteen minutes of trading, Ekman (1992) documented positive returns on all days except Mondays, and Hodgson (1994) found a positive return of 0.044 per cent. Unlike the overnight return, this return is still significantly positive when measured using midpoint returns (0.035 per cent), suggesting that a 'real' rise in prices occurs during this period.

While some of the patterns documented here and in prior articles are statistically significant, their *economic* significance is less obvious. For example, if a trader buys one contract at the close of SYCOM trading at 4 a.m. and then reverses this position when the floor market reopens at 9.50 a.m., a gain of 0.06 per cent would result. This equates to a profit of roughly $30 per contract before transaction costs, using a multiplier of $25 per index point and assuming the index level is at 2000. Transaction costs for traders would include fixed brokerage of at least $30 (this applies only to retail trades and would not be incurred on principal trades), exchange fees of $2 per contract round trip and the bid-ask spread which is typically one index point or approximately $25, a total of $57 for one contract and $75 for ten contracts.[11] While it

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[11] This brokerage charge is supplied by Ord Minnett Jardine Fleming Futures Limited, and is applicable to retail trading.

TABLE 1

INTRADAY SPI FUTURES RETURNS CALCULATED USING TRADE PRICES AND THE BID-ASK MIDPOINT

		Return (*100)					
Interval	N	Mean	Median	STD	Percent positive	Percent negative	*t* statistic[a]
Panel A: Returns calculation using trade prices							
Overnight	377	0.0600	0.0490	0.42	47.24	41.46	2.7909**
Floor open	377	0.0352	0.0492	0.21	54.83	33.94	3.2161**
Floor close	377	0.0114	0.0000	0.50	46.58	42.22	0.9928
SYCOM close	377	–0.0020	0.0000	0.07	3.61	4.22	–0.5184
Panel B: Returns calculation using bid-ask midpoint							
Overnight	377	0.0241	0.0000	0.45	44.62	51.97	1.0399
Floor open	377	0.0352	0.0298	0.25	57.44	38.38	2.8110**
Floor close	377	0.0030	0.0000	0.16	47.51	46.04	0.3578
SYCOM close	377	0.0081	0.0000	0.06	7.07	4.14	2.5473*

[a] Tests whether mean return is significantly different from zero.
* indicates significance at 0.005 level.
** indicates significance at 0.001 level.

may be possible for traders to reduce the significance of this charge by undertaking larger trades, the larger the trade the more likely the trader will sustain market impact costs. Further, traders would be required to satisfy margins of $2000 per contract. Thus, it is not clear whether the statistically significant positive returns are economically exploitable.

Table 2 provides direct evidence of a bid-ask bounce explanation for intraday patterns. It documents the percentage of trades which occur at the ask, midpoint and the bid prices. A significantly greater number of trades are found to occur at the bid just prior to SYCOM close (34 per cent of trades occur at a price greater than the midpoint and 54 per cent at less than the midpoint). By contrast, at market opening a greater percentage of trades occur at the ask (almost 48 per cent of trades occur at a price greater than the midpoint and 41 per cent at less than the midpoint). A chi-squared test suggests that the location within the spread at the close and open is significantly different from the location of trades within the spread across all intervals. These results are consistent with the differential between trade and midpoint returns documented in Table 1 and support the explanation that a trading frequency shift from the bid to the ask induces the apparent overnight price rise in trade prices.

According to Brock and Kleidon (1992) the optimal portfolio of market participants may change because of the increased volatility (risk) which has been documented to accompany the overnight period (e.g., French and Roll, 1986). Thus a possible explanation for these results is that market participants holding long positions in the underlying market hedge overnight by shorting futures. Clearly they

TABLE 2

PLACEMENT OF PRICES AT THE END OF INTERVALS RELATIVE TO BID AND ASK PRICES

Interval	N	Total greater than midpoint	More than one tick greater than midpoint	Less than one tick greater than midpoint	At midpoint	Less than one tick less than midpoint	More than one tick less than midpoint	Total less than midpoint	$-\chi^{2a}$
Opening	377	47.62%	35.06%	12.56%	11.29%	8.41%	32.68%	41.09%	17.13851*
Opening interval	377	38.30	7.17	31.13	18.59	33.58	9.52	43.10	42.19736*
Floor closing	377	41.70	4.50	37.20	13.79	34.09	10.42	44.51	52.45305*
SYCOM closing	377	33.48	26.90	6.58	12.08	6.60	47.83	54.43	35.79714*
All intervals	40698	41.43	22.96	18.47	11.79	20.62	26.17	46.17	

[a] Based on comparison of percentage of trades five ticks or more greater than, less than five ticks greater than, at, less than five ticks less, or five ticks or more less than the midpoint occurring at the end of the interval and the respective proportion of trades across all intervals.

*Indicates significance at 0.01 level.

would then close out their short positions when trading opens in the morning in order to re-expose their portfolios to market movements. In Australia the reverse is unlikely because investors typically hold long positions as a consequence of the restrictions on short selling on the ASX (see Aitken, Frino, McCorry and Swan, 1996). Such activity is consistent with the observed seller-initiated activity at the close of SPI trading, and buyer-initiated activity at the open.

CONCLUSIONS AND FUTURE RESEARCH DIRECTIONS

This article examined intraday patterns in returns for the SPI futures contract traded on the SFE. Interestingly, it revealed that while a positive and significant overnight trade-to-trade return is documented, consistent with Australian equity and overseas futures markets research, this becomes insignificant when SPI futures returns are calculated using the midpoint of the spread, suggesting that the way in which returns have been previously measured induces the result. This is consistent with the documented shift in trades occurring at the bid-price at the SYCOM close, to trades occurring at the ask-price at floor open. It is suggested that this shift from seller- to buyer-initiated trading is induced by market participants holding portfolios in the underlying market who wish to hedge their positions overnight by shorting a market-wide futures contract and then reversing this contract when trading opens in the morning. A positive opening trade-to-trade and midpoint return is also documented and, although statistically significant, costs of trading suggest that it is unlikely to be economically significant.

One significant difference between this study and prior research is that closing returns are not found to be significantly positive in this study. We suggest that this may be caused by the extended trading hours. Further research could explicitly examine the effect of extended trading hours on overnight returns. Another future research direction would be to undertake further analytical work and tests. In particular, our overnight hedging explanation could be better tested with broker/client futures data which could identify whether the specific traders initiating short positions at close also initiate long positions at open.

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